ArcelorMittal USA

August 16th, 2019

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Subject: **Conceptual Site Model (CSM) and Human Health Risk Assessment (HHRA)**
ArcelorMittal Indiana Harbor Long Carbon
East Chicago, IN

Mr. Pursel and Ms. Blankenship:

ArcelorMittal USA LLC is timely submitting this CSM and HHRA for the Indiana Harbor Long Carbon (IHLC) property located in East Chicago, Indiana. This document has been prepared as the next step in the RCRA FIRST process in accordance with the U.S. EPA letter dated May 29th, 2019. If you have any questions please contact me at (330) 659-9124.

Regards,

Cary Mathias

Enclosures

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HUMAN HEALTH RISK ASSESSMENT
INDIANA HARBOR LONG CARBON PROPERTY
EAST CHICAGO, INDIANA

by
Haley & Aldrich, Inc.
Boston, Massachusetts

for
ArcelorMittal USA LLC

File No. 129719-007
August 2019

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ASWQC	Ambient Surface Water Quality Criteria
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	Below ground surface
CA	Corrective Action
COCs	Constituents of Concern
COPC	Chemical of Potential Concern
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
DQOs	Data Quality Objectives
DSE	Data Sufficiency Evaluation
DSR	Data Summary Report
ELCR	Excess Lifetime Cancer Risk
EPC	Exposure Point Concentration
FIRST	Facility Investigation Remedy Selection Track
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IHE	Indiana Harbor East
IHLC	Indiana Harbor Long Carbon
IHSC	Indiana Harbor Ship Canal
ILCR	Incremental Lifetime Cancer Risk
IRIS	Integrated Risk Information System
LOAEL	Lowest-Observed-Adverse-Effect-Level
NCEA	National Center for Environmental Assessment
NCP	National Contingency Plan
NOAEL	No-Observed-Adverse-Effect-Level
NRC	National Research Council
NRWQC	National Recommended Water Quality Criteria
OAF	Oral Absorption Factor
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PEF	Particulate Emission Factor
PPRTV	Provisional Peer Reviewed Toxicity Value
QA/QC	Quality Assurance/Quality Control
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RfCs	Reference Concentrations
RfD	Reference Dose
RFI	RCRA Facility Investigation
RME	Reasonable Maximum Exposure
RSL	Regional Screening Level
SVOC	Semivolatile Organic Compound
SWMA	Solid Waste Management Unit
UCL	Upper Confidence Limit
URs	Unit Risks

U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich), on behalf of ArcelorMittal USA LLC (ArcelorMittal), has prepared this Risk Assessment in support of the Resource Conservation and Recovery Act (RCRA) Facility Investigation Remedy Selection Track (FIRST) process for the Indiana Harbor Long Carbon (IHLC) property (herein referred to as the "IHLC property"), a sub-parcel of the larger ArcelorMittal Indiana Harbor East (IHE) facility, located in East Chicago, Indiana (Figure 1, Project Locus).

1.1 SITE DESCRIPTION

The IHLC property includes former IHE Plant 4 (Solid Waste Management Unit [SWMA] 2) and is located at 3300 Dickey Road, Lake County, East Chicago, Indiana. The IHLC property is located in the southern "on-shore" portion of the IHE property, approximately 4,000 feet south of the original Lake Michigan shoreline (Figure 1). The IHLC property includes approximately 92 acres of the approximately 2,400-acre IHE property and comprises Lake County Parcel Nos. 45-03-21-201-001.000-024 (88.26 acres) and 45-03-16-451-001.000-024 (4.056 acres). A Site Plan showing general historical operations layout and features is included as Figure 2.

1.2 PROJECT OBJECTIVE

On 8 March 1993, ArcelorMittal (formerly Mittal Steel USA Inc., ISPAT Inland Inc. [ISPAT], and Inland Steel Company [Inland]) entered into a *Multimedia Consent Decree (Civil Action H90-0328)* with the United States Environmental Protection Agency (U.S. EPA) to address in part, RCRA Corrective Action (CA) requirements at ArcelorMittal's IHE facility (EPA ID. No. IND 005 159 199). Per the Consent Decree, ArcelorMittal is responsible for performing the RCRA CA Program as set forth in Section VII of the Consent Decree and associated Appendices (I through V).

The IHLC facility shut-down operations in 2015 and the IHLC property was transferred to ArcelorMittal's corporate Real Estate and Environmental Group and is being marketed for sale/redevelopment. To assist in and to expedite the marketability and sale of the IHLC property, ArcelorMittal is separating the on-Site RCRA CA obligations from those of the ongoing IHE facility-wide RCRA CA mentioned above. ArcelorMittal is performing an accelerated RCRA CA on the IHLC property utilizing the U.S. EPA's recently published RCRA FIRST – A Toolbox for Corrective Action (U.S. EPA, 2016a). The RCRA FIRST toolbox was developed using Lean techniques to improve the efficiency of the RCRA CA process.

On 30 May 2018, ArcelorMittal submitted a RCRA Facility Investigation (RFI) Data Sufficiency Evaluation (DSE), outlined in RCRA FIRST Tool 4, to the U.S. EPA to demonstrate project Data Quality Objectives (DQOs) have been satisfied for the IHLC property, and that the data are sufficient to proceed to the next step in the RCRA FIRST process (Haley & Aldrich, 2018). The U.S. EPA responded with comments to the Evaluation on 19 July 2018 (July 2018 Comment Letter). ArcelorMittal responded to the U.S. EPA's comments on 11 January 2019 and agreed to complete verification sampling as next step efforts to complete Corrective Action (ArcelorMittal, 2019).

The goals of the verification sampling activities were to:

- Collect groundwater samples to determine if constituents of concern (COCs) in groundwater are stable or decreasing; and
- Collect surface and subsurface soil samples to facilitate the completion of the property-specific Conceptual Site Model (CSM) and Human Health Risk Assessment (HHRA) for the IHLC property.

ArcelorMittal submitted a Data Summary Report (DSR) to U.S. EPA on 17 May 2019; the DSR detailed the findings of verification sampling activities (Haley & Aldrich, 2019). On 29 May 2019, U.S. EPA provided concurrence with the recommendations of the DSR, indicating that ArcelorMittal should proceed with the next steps of the RCRA FIRST process, which are to update the CSM and develop the HHRA (U.S. EPA, 2019a).

1.3 REPORT ORGANIZATION

Section 2 of this report provides a CSM; the CSM is an update of the CSM that was provided in the DSE. As documented in the CSM, there is limited to no quality habitat for environmental receptors at the Site, and the foreseeable use of the Site will continue to offer limited to no quality habitat for environmental receptors. Furthermore, as documented in Section 2, groundwater verification sampling performed in 2019 has supported the conclusions of previous risk assessments for the Site, which demonstrated that Site groundwater did not pose unacceptable risks to aquatic receptors in adjacent surface waters. Therefore, the remainder of the risk assessment focusses on potential risk to human health.

Sections 3 through 6 of this report present the four steps of the HHRA process:

- Data Evaluation (Section 3)
- Exposure Assessment (Section 4)
- Toxicity Assessment (Section 5)
- Risk Characterization (Section 6)

These components of the risk assessment are presented for exposure pathways that are determined to be potentially complete in the CSM (Section 2). Section 7 provides a summary and conclusions of the HHRA. Supporting documentation of the risk assessment methods, inputs, and results are provided in tables, figures, and appendices to this document. References are provided at the end of the document.

2. Conceptual Site Model

The CSM describes the sources and potential migration pathways through which Site-related constituents may have been transported to other environmental media, and the human and environmental receptors that may in turn contact the environmental medium. The linkage between an environmental medium and potential exposure is called an exposure pathway. The CSM is used to guide the identification of appropriate exposure pathways and receptors for evaluation in the risk assessment.

The DSE provided a CSM for the Site; the CSM included a presentation and summary discussion of:

- Physical features and physiography, geology, and hydrogeology;
- Corrective Action program status;
- Phase I and II RFI status and results; and
- Land uses, receptor populations, and potential exposure pathways.

Based on the CSM provided in the DSE, U.S. EPA identified three data gaps:

1. Current groundwater conditions near historical source areas;
2. Soil quality as related to potential direct contact exposures; and
3. Indoor air quality as related to potential vapor intrusion into facility buildings.

These data gaps were addressed through responses to EPA's comments on the DSE and verification sampling that was performed in 2019 and summarized in the DSR.

The CSM presented in this report incorporates the results of the verification sampling to identify potential exposure pathways to residual Site-related constituents present in soil and groundwater at the Site. The following sections identify current and future land use, potentially exposed populations, and potential exposure pathways.

2.1 LAND USE

The IHLC property is located in a heavy industrial area of East Chicago, Indiana, approximately 4,000 feet south of the Lake Michigan shoreline. The IHLC property includes former IHE Plant 4, which was constructed in the early 1940s, during World War II, to produce cast armor for use in military battle tanks. Because the plant was initially constructed as a cast armor plant, there are few sub-grade structures (e.g., pits, trenches, sumps) present that are typical of steel mills. Further, much of the now vacant property is covered by asphalt/concrete pavement, rail spurs, access roads, and structures. In addition, Plant 4 was constructed predominantly on the original Lake Michigan shoreline and in general only two to five feet of fill material underlies the IHLC property. Access to the IHLC property is highly controlled through security fencing and 24-hour guarded checkpoint entry; and therefore, the occurrence of trespassers on the IHLC property is highly unlikely.

IHLC is bound on the west by the Indiana Harbor Ship Canal (IHSC), to the east by Dock Street and rail lines followed by Chrome LLC, to the north by Dickey Road and former Plant 3, and to the south by American Terminals and Kemira. According to the most recently available zoning classifications for the City of East Chicago, Indiana (2003), adjacent properties to the IHLC property are zoned heavy industrial. There are no residential land uses associated with properties adjacent to the Site. The IHSC is located adjacent west of the Site, which although unlikely, may be used for recreational purposes. Further, the following are neither located on the IHLC property nor located within the immediate vicinity of the IHLC property:

- Day-care facilities;
- Residences;
- Ecological receptors (excluding the ISHC); and
- Food sources.

Given that the facility and surrounding properties are heavily industrialized, with much of the land covered by structures and pavement, there is no terrestrial habitat.

Groundwater under the IHLC property and in the adjacent areas is not currently used for potable purposes, and there are no known plans to use groundwater for such purposes in the future. Further, there are no known or expected incidental uses of groundwater in adjacent areas for uses such as irrigation or industry. Drinking water in the area is provided by the city of East Chicago whose public water supply intake structure is located in Lake Michigan approximately one-half mile north of the original shoreline and one-half mile from the eastern boundary of the IHE facility.

ArcelorMittal plans to sell the property for industrial re-use, which will propitiously create jobs to support the local economy. Further, redevelopment of the now vacant property will be aesthetically positive for the surrounding community. ArcelorMittal has begun marketing the IHLC property and has had positive discussions with potential buyers looking to redevelop the property and facility. Institutional controls will be used to ensure that the land remains industrial use.

2.2 POTENTIAL RECEPTORS

Based on the information presented herein, and the results of the evaluation presented in *the EI Determination* (Earthtech, 2005) and *Phase I and II RFIs* (AECOM, 2009; 2012) as they pertain to the IHLC property, the potential receptors under current and future industrial property use conditions are as follows:

- Re-development construction workers at the IHLC property;
- Construction/utility workers at adjacent industrial properties;
- Industrial workers at the IHLC property;
- Industrial workers at adjacent industrial properties;
- Recreational users of surface water bodies situated adjacent to the IHLC property; and
- Aquatic life in surface water bodies situated adjacent to the IHLC property.

Due to institutional controls that will be placed on the property, human populations other than industrial workers and construction/utility workers will not be present at the IHLC property. In addition, because there is no terrestrial habitat at the IHLC, terrestrial mammals and birds are not identified as potential receptors at the Site.

2.3 EXPOSURE PATHWAY EVALUATION

Exposure pathways describe the course chemicals may take from the source to the exposed individual. For an exposure pathway to be complete, the following conditions must exist (as defined by U.S. EPA [1989]):

1. A source and mechanism of chemical release to the environment;
2. An environmental transport medium;
3. A point of potential contact with the receiving medium by a receptor; and
4. A receptor exposure route at the contact point.

Exposure routes include:

- Incidental ingestion;
- Dermal contact; and
- Inhalation of dust and vapor.

If any of these conditions are not present, the exposure pathway is not complete, and exposure to constituents in the exposure medium cannot occur. Potential exposure pathways for the receptors identified in section 2.2 are evaluated below. A summary of exposure pathways and rationale for why pathways are potentially complete, or incomplete is provided in Table 1, and a graphical depiction of exposure pathways is provided in Figure 3.

2.3.1 On-Site Groundwater

Presently, there are no exposures to on-Site groundwater because the facility is not actively being used and no construction activities are occurring. Any utility or construction activities that may be required under current conditions are controlled by way of institutional controls on workers involved in excavations and related dewatering activities. Ispat Inland Policy No. 261, Procedure ENV-P-021, and Ispat Inland Compliance Program for 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, formalize IHLC's (formerly Inland's) excavation permitting and worker protection program. The program establishes a permitting framework and general requirements and responsibilities to ensure that excavation and de-watering activities at the IHW are handled in a manner that is consistent with the hazardous waste regulations and minimizes the potential for worker exposure to potentially hazardous environmental contaminants.

Under future conditions which assume that IHLC's institutional controls are not in place, re-development construction workers are assumed to potentially contact groundwater during excavation activities. The Phase II RFI evaluated potential exposures to groundwater by construction/utility workers using a tiered risk-based screening process (AECOM, 2009). The process involved comparison of constituent concentrations in groundwater directly to risk-based screening levels protective for direct contact with groundwater (Tier 1A screening). The risk-based screening levels were based on a generic assumption that an adult worker would drink one liter of groundwater per day and were derived for an excess lifetime cancer risk (ELCR) of $1x10^{-5}$ and a target HI of one (1). These values are conservative for application to construction workers because construction workers would only be exposed dermally to groundwater during intrusive excavation activities.

Groundwater verification sampling performed in 2019 demonstrated that constituent concentrations had generally decreased and that only arsenic and benzene were detected in Site groundwater at concentrations above the Tier 1A screening levels. Therefore, direct contact exposure pathways to groundwater for future on-Site construction workers were evaluated as potentially complete. Appendix A provides a comparison of the groundwater sampling data to the Tier 1A criteria.

Future on-Site industrial workers would not be exposed to contaminated groundwater during the course of their daily work activities. As stated previously, groundwater is not used at the IHLC property as a potable or non-potable water supply. Therefore, this exposure pathway is incomplete.

2.3.2 Off-Site Groundwater

Groundwater at the IHLC property is the environmental medium that has the greatest potential for causing contaminant migration to off-Site locations. Therefore, the medium is most likely to be associated with potentially complete exposure pathways for off- Site receptors. Properties adjacent to the IHLC property are industrial, and the adjacent water body (IHSC) could be used for recreational purposes. Therefore, exposure pathways are potentially complete for the following receptor groups:

- Recreational users who may incidentally contact constituents in groundwater that migrate to off-Site surface waters (IHSC), during recreational uses of the surface water.
- Aquatic life that may be exposed to constituents in groundwater that migrate to off-Site surface waters (IHSC).
- Off-Site construction/utility workers exposed to groundwater and associated saturated subsurface soils as a result of groundwater migrating from the IHLC property to adjacent off-Site construction sites where excavations are involved.

The Phase II RFI documented that the probability of recreational-based exposure to surface water adjacent to the IHLC is low to non-existent because the IHSC is an industrial shipping channel with confined physical space that is not amenable to nor aesthetically inviting for swimming or recreational boating. Nevertheless, Tier 1A screening criteria used to evaluate perimeter groundwater data in the Phase II RFI were based on human health criteria applicable to surface water, including IDEM ambient surface water quality criteria (ASWQC) and U.S. EPA National Recommended Water Quality Criteria (NRWQC) (AECOM, 2009). Those criteria are protective for use of surface water for swimming and fishing (i.e., consumption of fish that may bioaccumulate constituents from surface water bodies), as well as protection of aquatic life.

The Phase II RFI also developed Tier 1B screening criteria, which were based on application of a dilution attenuation factor to the Tier 1A screening criteria. Use of a dilution attenuation factor is appropriate for evaluation of potential exposures to Site-related constituents in groundwater that is migrating to surface water or to off-Site locations because constituent concentrations measured in on-Site perimeter groundwater would be diluted by the time the groundwater migrated to off-Site locations or to surface water.

Groundwater verification sampling performed in 2019 demonstrated that, with the exception of benzene at location IMW-03-00004, no constituents were detected in Site perimeter groundwater monitoring locations at concentrations above the Tier 1B screening levels. With respect to location IMW-03-00004, benzene detections were above the Tier 1B ecological screening values. However, monitoring wells between IMW-03-00004 and the nearest surface water body did not exhibit benzene concentrations above Tier 1B ecological screening values. Therefore, there are no significant exposure pathways to groundwater for off-Site construction workers, or for recreational uses and aquatic life in surface waters where Site groundwater may be migrating. Appendix A provides a comparison of the verification groundwater sampling data to the Tier 1B criteria.

2.3.3 On-Site Surface Soil

Surface soils are defined as soil from ground surface to a depth of two feet below ground surface. Potential impacts associated with other former facility operations and with incidental spills may have occurred on the IHLC property. However, much of the IHLC property is covered with concrete, asphalt, or industrial structures, thereby minimizing the probability of direct contact with surface soils. Under current condition, the facility is idle and secured, so any contact with unpaved surface soils (e.g., by a trespasser) would be infrequent and incidental in nature. Under future industrial uses of the Site, potential exposures to areas of soil that are not paved could hypothetically occur.

- Future On-Site Industrial Workers: Future industrial workers at the IHLC property are expected to have minimal exposure to surface soils during the course of their daily work activities. However, work activities that are performed in unpaved areas could potentially result in incidental ingestion and dermal contact with surface soil, as well as inhalation of dust and vapor that may be released from surface soil.
- Construction Worker: Under future conditions which assume that IHLC's institutional controls are not in place, re-development construction workers are assumed to potentially contact surface soil during construction activities. Exposure to surface soil could occur through incidental ingestion and dermal contact, and inhalation of dust and vapor that may be released from surface soil.

2.3.4 Off-Site Surface Soil

ArcelorMittal has significant programs which control storm water run-off and fugitive dust emissions including a Storm Water Pollution Prevention Plan, which controls run-off to adjacent surface waters to the extent possible and includes Quarterly Inspections of the perimeter, and a Dust Control Plan which controls fugitive dust from roads, material storage piles, processing operations and material transfer activities. Due to the current and on-going implementation of these policies and procedures, this exposure pathway is incomplete.

However, under future use conditions that assume the controls that ArcelorMittal has put in place no longer exist, constituents in unpaved surface soils on the ArcelorMittal property could hypothetically migrate to adjacent properties via wind erosion and particulate transport. Given the relatively small areas of unpaved soil at the IHLC, dust generation and off-Site transport of particulates is unlikely to be significant. In addition, most of the ground in surrounding properties is covered with pavement and structures, so even if particulate transport from the IHLC occurs, the probability of off-Site industrial workers having direct contact with constituents originating from IHLC unpaved surface soils is very low. Consequently, this exposure pathway is considered to be incomplete.

2.3.5 On-Site Subsurface Soil

Subsurface soils are defined as those below a depth of 2 feet below ground surface. Any utility or construction activities that may be required under current conditions are controlled by way of institutional controls on workers involved in excavations, as described in subsection 2.3.1.

- Future On-Site Industrial Workers: Future industrial workers at the IHLC property are not expected to have exposure to subsurface soils, as they would not be involved in excavation activities. Therefore, there are no complete exposure pathways to subsurface soil for future on-Site industrial workers.
- Construction Worker: Under future conditions which assume that IHLC's institutional controls are not in place, re-development construction workers are assumed to potentially contact subsurface soil during construction activities. Exposure to subsurface soil could occur through incidental ingestion and dermal contact, and inhalation of dust and vapor that may be released from surface soil.

2.3.6 Off-Site Subsurface Soil

Based on the absence of historical operational practices at the IHLC property that would have directly resulted in significant off-Site subsurface soil contamination, the only mechanism for such contamination is through the migration of contaminated groundwater from the IHLC property to off-Site locations. As discussed in section 2.3.2, exposure pathways related to migration of IHLC property groundwater to off-site locations are insignificant. Therefore, the off-Site subsurface soil exposure pathway is incomplete.

2.3.7 Sediment

There are no on-Site surface waters and thus, no associated on-Site sediments at the IHLC property. The surface waters and sediments of the IHSC have been impacted by numerous industrial and municipal discharge of contaminants. However, with regard to sediments, the U.S. EPA and ArcelorMittal have agreed that relative to RCRA Corrective Action at the IHE facility, assessment of the IHSC and Indiana Harbor sediments is not relevant because sheet pile revetments are in place and are maintained by ArcelorMittal to prevent future impacts to the IHSC from the IHE facility. In addition, dredging work is to be completed in the IHSC by the US. Army Corp of Engineers with funds supplied PRPs.

2.3.8 Indoor Air

The potential for impacts to indoor air quality at the IHLC property is primarily dependent upon two factors: 1) the presence of significantly contaminated soil or groundwater in close proximity to structures, and 2) the physical characteristics of the structures.

While no direct measurements of the potential presence of volatile contaminants in indoor air have been conducted during RFI investigations, groundwater data that have been collected provide an indirect measure of the location and magnitude of potential indoor air exposures. In those areas outside of the former coking byproduct recovery and processing areas, including the IHLC property, structures are typically very large in size with very high rates of air exchange, thus indicating that vapor intrusion to indoor air (if VOCs were present at significant concentrations in groundwater or soil) is not a significant exposure pathway.

On 16 October 2018, ArcelorMittal along with representatives from the U.S. EPA Region 5, performed a walk-through of the IHLC property. Based on observations and statements made by the U.S. EPA, and in accordance with the *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (U.S. EPA, June 2015), Section 2.4 (Air Exchange and Mixing), for the vapor intrusion scenario, considering the significant size, air infiltration, and natural ventilation of the current property building, any potential effects of vapor intrusion of vapor-forming chemicals will be mitigated via dilution. Therefore, the vapor intrusion pathway is considered to be insignificant.

Groundwater flows from the IHLC property into the IHSC. Similarly, as indicated in the EI Determination (Earth Tech, 2005) during Phase I and Phase II RFI activities in the vicinity of FPA 6, concentrations of VOCs at the facility perimeter were found to be low or non-detect. In order for vapor intrusion to be a potential concern for the industrial setting present at/around the IHLC property, VOC concentrations in groundwater would typically have to be orders of magnitude higher than those detected in FPA 6. Therefore, the vapor intrusion pathway in off-Site properties is not significant with respect to potential sources of VOCs at the IHLC property.

2.3.9 Outdoor Air

As indicated in the EI Determination (Earth Tech, 2005), the potential for “contaminated” outdoor air at the IHLC property is primarily dependent upon the presence of significantly contaminated soil or groundwater in close proximity to the potentially exposed receptors combined with a limited amount of air exchange in the area. While no direct measurements of the potential presence of volatile contaminants in outdoor air have been conducted during the RFI, groundwater data and soil data that have been collected provide an indirect measure of the location and magnitude of potential outdoor air exposures. In order for elevated concentrations of VOCs to be present in outdoor air at levels exceeding risk-based human health criteria in the industrial setting present at/around the IHLC property, their respective concentrations in groundwater and soil would typically have to be orders of magnitude higher than those detected on-Site.

Therefore, based upon the considerations presented above, exposure pathways to Site-related constituents in outdoor air are insignificant.

3. Hazard Identification

3.1 DATA SUMMARY INFORMATION

Soil data used to identify COPCs at the Site were provided in the DSR and are summarized below. As described in the DSR, the data used in this HHRA are sufficient in quality and quantity to perform this HHRA and to make risk management decisions for the Site. Soil samples were collected at the Site during an investigation conducted in 2019.

Soil borings were advanced at ten locations with unpaved soil (Figure 4). The borings were advanced to approximately ten feet below surface grade and split-spoon samples were collected. Two soil samples were collected from each soil boring and were submitted to the project laboratory for analysis. One soil sample from each soil boring was collected from the surface (zero to two feet), and a second soil sample was selected based on field observations and headspace screening or was collected from the two-foot interval immediately above groundwater.

Soil samples, along with field duplicates and matrix spike/matrix spike duplicates, collected for quality assurance/quality control (QA/QC), were packaged and shipped under proper chain-of-custody procedures to TestAmerica Laboratories, Inc. (TestAmerica) in North Canton, Ohio. Samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, sulfide, and cyanide in accordance with Project Target Parameters, Appendix IX Analytes.

The analytical data for surface soil (zero to two feet bgs) and total soil (surface and subsurface soil combined, to a depth of ten feet bgs) were summarized separately to identify the frequency of detection (number of positively detected results/total number of results), the range of reporting limits for non-detect values, and the range of detected concentrations. The following procedures were applied when summarizing the analytical data:

- Only analytes that were positively detected in at least one sample were included in the data summary.
- Results qualified as estimated ("J" qualified) were used in the risk assessment.
- Data for field duplicate samples were included as individual sample results.

The analytical data summaries for surface and total soil are provided in Tables 2 and 3, respectively. Section 3.2 provides the methods used to review these data sets to select COPCs.

3.2 CHEMICALS OF POTENTIAL CONCERN

COPCs are chemicals that are retained for further evaluation in the HHRA. A concentration-toxicity screening is used to reduce the number of chemicals evaluated in the risk assessment to only those that would potentially pose more than a *de minimis* health risk (U.S. EPA, 1989). The procedure used to select COPCs for the HHRA is summarized as follows, and is consistent with U.S. EPA methodology (U.S. EPA, 1989; 2019). The COPC selection is documented on Tables 2 and 3:

1. If the maximum detected concentration is below risk-based screening levels (i.e., Regional Screening Levels (RSLs), U.S. EPA, 2019b), the detected chemical may be eliminated as a COPC.

2. If the maximum detected concentration exceeds the risk-based screening level, or if no screening level exists, the analyte is selected as a COPC.
3. If the detected chemical is considered an essential nutrient, it may be excluded as a COPC.

Further details on the COPC selection methodology are provided below. A summary of the COPC selection results is provided in Section 3.2.3.

3.2.1 Risk-Based Screening

The maximum detected concentration of each chemical is compared to the appropriate human health risk-based screening value. These screening values represent concentrations at or below which there is no potential health concern. For the surface and subsurface soil data sets, screening was conducted using the U.S. EPA RSLs for industrial soil (U.S. EPA, 2019b). The industrial soil RSLs are based on upper-bound exposure assumptions for direct contact with soil (incidental ingestion and dermal contact), dust inhalation, and ambient vapor inhalation, and therefore are protective screening criteria.

RSLs used for screening are based on a target cancer risk of 1E-06 and a target hazard quotient of 0.1. The exception to this is for lead: due to toxicity characteristics, the RSL value for lead is not reduced by a factor of 10 because risk associated with lead is not additive with risk for other constituents.

The results of the screening against RSLs (shown on Tables 2 and 3) are as follows:

- For surface soil from zero to two feet bgs, eight constituents were selected as COPCs. Four of these constituents (methyl cyclohexane, carbazole, dimethyl phthalate, and sulfide) were retained as COPCs because RSLs have not been published for them.
- For total soil (zero to ten feet bgs), eight constituents were selected as COPCs. Four of these constituents (methyl cyclohexane, carbazole, dimethyl phthalate, and sulfide) were retained as COPCs because RSLs have not been published for them.

3.2.2 Essential Nutrients

Metals detected in soil which are considered essential human nutrients were eliminated as COPCs, in accordance with U.S. EPA Risk Assessment Guidance (RAGS Part A, 1989). These metals include:

- Magnesium
- Sodium

These essential nutrients are not further evaluated as COPCs in this human health risk assessment. Iron is also considered to be an essential nutrient; however, U.S. EPA has published toxicity values and an RSL for iron and therefore it was evaluated using the risk-based screening process (Section 3.2.1).

3.2.3 Summary of Screening

COPCs selected for surface and subsurface soil are indicated in Tables 2 and 3 and listed below.

COPCs	**Surface Soil (0 to 2 ft bgs)**	**Total Soil (0 to 10 ft bgs)**
VOCs		
Methyl cyclohexane	x	x

COPCs	Surface Soil (0 to 2 ft bgs)	Total Soil (0 to 10 ft bgs)
SVOCs		
Carbazole	x	x
Dimethyl phthalate	x	x
Inorganics		
Sulfide	x	x
Arsenic	x	x
Iron	x	x
Manganese	x	x
Thallium	x	x

4. Exposure Assessment

This risk assessment is being conducted to evaluate potential future conditions, in advance of potential sale and redevelopment of the Property. Therefore, the evaluation is focused on future, rather than current, use. The CSM (Section 2) identified the populations of humans that may potentially use or access the Site under proposed future land use conditions and the potentially complete exposure pathways. This exposure assessment focuses on describing the methods that are used to quantify exposures through each of the potentially complete exposure pathways identified in the CSM. Exposures are quantified by developing receptor exposure scenarios, identifying exposure point concentrations, and then calculating chemical intakes.

These components are described in the sections below.

4.1 POTENTIAL EXPOSURE PATHWAYS

There are three exposure routes by which humans can be exposed to COPCs in soil: ingestion, dermal contact, and inhalation of fugitive dust and vapor that may be released from soil. Complete exposure pathways for future receptors at the Property, as defined in Section 2, are as follows:

Receptor	Exposure Point	Exposure Pathway
Industrial Worker	Surface Soil (0 – 2 ft. bgs)	- Dermal Contact - Incidental ingestion - Particulate (dust) inhalation - Ambient vapor inhalation
Construction Worker	Surface Soil (0 – 2 ft bgs) Total Soil (0 – 10 ft bgs)	
	Groundwater	- Dermal Contact - Incidental ingestion

Incomplete or insignificant exposure pathways at the Site, which are not further evaluated in this risk assessment, include the following:

- Potable or non-potable uses of groundwater. Extraction and use of groundwater for any purposes is prohibited, in accordance with the Institutional Controls.
- Direct contact with constituents in groundwater that may migrate to surface water. Constituents in groundwater are below risk-based screening levels protective for recreational and angling exposures to surface water, as well as aquatic life exposures to surface water.
- Vapor intrusion to indoor air from soil or groundwater. Considering the significant size, air infiltration, and natural ventilation of the current property building, any potential effects of vapor intrusion of vapor-forming chemicals will be mitigated via dilution.

4.2 REASONABLE MAXIMUM EXPOSURE SCENARIOS

Exposure scenarios are used to quantitatively describe the COPC exposures that could theoretically occur for each land use and exposure pathway evaluated. The exposure scenarios are used in conjunction with exposure point concentration (EPCs; section 4.3) to derive quantitative estimates of COPC intake or exposure. For each receptor population, the RME was quantified. The RME is defined by the U.S. EPA as the highest exposure that is reasonably expected to occur at a Site (U.S. EPA, 1989). It should be noted that the intent of the RME is to provide a conservative estimate of exposure, which is well above the average exposure but still within the range of plausible exposures. The RME is determined using upper bound estimates (i.e., 90th to 95th percentile values) for key exposure parameters.

As such, a single exposure scenario is often selected to provide a conservative evaluation for the range of possible receptors and populations that could be exposed at the Site under a given land use. When evaluating industrial land use, an industrial workers scenario that is modeled to be protective for the adults who work at the Site full time is protective for all other receptor populations who may access the Site (such as visitors, contractors, landscaper workers) and, therefore, it unnecessary to also evaluate those other, less-exposed, receptor populations. For this reason, two exposure scenarios are evaluated in this HHRA to conservatively capture the range of potential exposures that could hypothetically occur under the re-developed land use.

The two exposure scenarios evaluated in this risk assessment are as follows:

- Industrial Worker: This scenario models high frequency, ‘outdoor’ exposure to soil over a long period of time. Standard U.S. EPA default exposure factors for a commercial worker scenario are used, which assume that an adult is exposed to soil via incidental ingestion, dermal absorption, and dust and vapor inhalation under the following conditions (U.S. EPA, 2014):
  - Exposures occurring 8 hours per day, 250 days per year, for 25 years
  - Incidental soil ingestion rate of 100 mg/day
  - Dermal contact with soil over a surface area of 3,527 cm^2 and an adherence factor of 0.12 mg/cm^2.

- Construction Worker: This scenario models adult workers who are assumed to be engaged in short-term, high frequency, high intensity exposure to soil during soil handling/earth work activities. The scenario assumes that an adult is exposed to soil via incidental ingestion, dermal absorption, and dust and vapor inhalation, as well as groundwater by incidental ingestion and dermal absorption, and is used to evaluate whether there could be health risks of concern for construction workers engaged in re-development work. The scenario is protective for workers who may be involved in shorter term intrusive utility or excavation work after re-development. Although exposure pathways may be complete for both surface soil and subsurface soil, the exposure scenario evaluates potential exposures to total soil (soil zero to ten feet bgs) because the scenario is intended to reflect exposures associated with soil excavation activities, which are assumed to involve soil within the top ten feet of ground surface. Exposure parameters used to evaluate construction worker exposure to soil are U.S. EPA default values (U.S. EPA, 2002a; 2019) and are as follows:
  - Exposures occurring 8 hours per day, 5 days per week, for 50 weeks
  - Incidental soil ingestion rate of 330 mg/day
  - Dermal contact with soil over a surface area of 3,527 cm^2 and an adherence factor of 0.3 mg/ cm^2.

  Since U.S. EPA does not publish default exposure factors for evaluating construction worker exposures to groundwater, exposure parameters were selected using professional judgement, as follows:
  - Exposures occurring 8 hours per day, 5 days per week, for 25 weeks, under the assumption that contact with groundwater would occur on no more than one-half the work-days;
  - Incidental groundwater ingestion rate of 0.01 liters per day, based on the value used to derive the Tier 1B groundwater direct contact values (AECOM, 2009); and

- Dermal contact with soil over a surface area of 3,527 cm^2, based on the dermal surface area value used for soil.

4.3 EXPOSURE POINT CONCENTRATIONS

The U.S. EPA defines the EPC as the representative chemical concentration a receptor may contact at an exposure point over the exposure period (U.S. EPA, 1989). The typical concept of human exposure within a defined exposure point is that an individual contact the contaminated medium on a periodic and random basis. Because of the repeated nature of such contact, the human exposure does not generally occur at a fixed point but rather at a variety of points with equal likelihood. Thus, the EPCs should be the arithmetic averages of the COPC concentrations. However, to account for uncertainty in estimating the arithmetic mean concentration, the U.S. EPA recommends that an upper confidence limit (UCL) be used to represent the EPC.

In accordance with U.S. EPA guidance, UCL95 values were calculated using U.S. EPA ProUCL Statistical Software for Environmental Applications version 5.0.02 (U.S. EPA, 2016b). The ProUCL software performs a goodness-of-fit test that accounts for data sets without any non-detect observations, as well as data sets with non-detect observations. The software then determines the distribution of the data set for which the EPC is being derived (e.g., normal, lognormal, gamma, or non-parametric), and then calculates a conservative and stable 95% UCL value in accordance with the framework described in "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites" (U.S. EPA, 2002b). The software includes numerous algorithms for calculating 95% UCL values and provides a recommended UCL value based on the algorithm that is most applicable to the number of data points and statistical distribution of the data set. When ProUCL recommended more than one UCL for use, the highest of the recommended values was conservatively selected as the representative 95% UCL. ProUCL does not calculate 95% UCL values when a constituent is detected fewer than two times in an exposure point data set. ProUCL calculations are provided in Appendix C.

In accordance with U.S. EPA guidance, the exposure point concentration to evaluate Reasonable Maximum Exposure (RME) was selected as the lower of the calculated 95% UCL, or the maximum detected concentration. EPCs for surface soil and total soil are provided in Tables 2 and 3.

For groundwater, the maximum detected concentration from the most recent sampling round is used as the EPC.

EPCs that are used to evaluate inhalation exposures to dust and vapor from soil must be modeled from source media (i.e., soil) concentrations. The basis of modeled EPCs used in the HHRA is described below; modeling documentation is provided in Appendix D.

- Soil – Vapors in Ambient Air: There is only one constituent retained as a COPC that U.S. EPA considers to be volatile (methyl cyclohexane). The Jury model, as used to derive the U.S. EPA RSLs (U.S. EPA, 2019b), is used to estimate ambient air concentrations that may exist above soil that contains VOCs. A site-specific Q/C parameter value that is based on a nine-acre site size, depth of soil contamination of 10 ft bgs, and climatological data for Chicago, IL are used in the model. The site size of nine acres is based on a conservative estimation that 10% of the property is unpaved.
- Soil – Dust in Ambient Air: The Jury model, as used to derive the U.S. EPA RSLs (U.S. EPA, 2019b), is used to estimate a particulate emission factor (PEF) that can then be used to derive dust concentrations in ambient air. A site-specific Q/C parameter value that is based on a nine-

acre site size and climatological data for Chicago, IL are used in the model. The site size of nine acres is based on a conservative estimation that 10% of the property is unpaved.

- Soil – Dust in Ambient Air During Construction Activities: To account for increased dust concentrations that may be present during soil excavation activities due to wind erosion, excavating and dumping activities, grading, and dozing, the PEF is calculated using dispersion models presented in U.S. EPA RSL Calculator (U.S. EPA, 2019b) that account for the cumulative dust loading in air from each of these activities. This PEF is used for the construction worker scenario and is based on the assumption that a portion of the undeveloped area of the Site (two acres) gets re-developed in a manner that generates dust through mechanical excavation of soil to ten feet bgs, bulldozing, and grading. Although construction workers could also be exposed to fugitive dust from wind erosion of un-vegetated soil, the level of dust associated with that source is orders of magnitude lower than that associated with excavation activities and was therefore not included in the PEF.

4.4 CALCULATION OF INTAKE

The intake (i.e., ingestion, dermal absorption, or inhalation) of COPC by a human was quantified according to standard U.S. EPA calculation algorithms (U.S. EPA, 1989; 2004; 2009). Intakes are quantified to estimate the potential for non-cancer and carcinogenic health effects.

Chemical-specific input parameters used to calculate intake include the oral absorption factor and the dermal absorption factor. The oral absorption factor is 1 for all COPCs except arsenic, for which a value of 0.6 is used (U.S. EPA, 2019b). Dermal absorption factors are provided in U.S. EPA guidance (U.S. EPA, 2004) and include a value of 0.03 for arsenic and 0.1 for other SVOCs (which was applied to carbazole and dimethyl phthalate). U.S. EPA does not provide dermal absorption factors for VOCs or sulfide, iron, manganese, and thallium.

Intakes and associated non-cancer and cancer risk estimates were calculated using the U.S. EPA on-line RSL calculator (USPEA, 2019), using the 'risk output' mode. The 'risk output' mode uses EPCs with the receptor scenario exposure parameters to derive quantitative intakes. The intake values are then used with toxicity values (Section 5) to derive cancer risk and non-cancer hazard index values. Documentation of the RSL calculator input and output values is provided in Appendix D.

5. Toxicity Assessment

The objective of the toxicity assessment is to quantify the relationship between the intake, or dose, of COPCs and the likelihood that adverse health effects may result from exposure to the COPCs. There are two major types of adverse health effects evaluated in the HHRA: non-carcinogenic, and carcinogenic. Non-carcinogenic health effects refer to toxicological effects other than cancer which may result from exposure to a substance, such as toxicity to the liver, skin, or central nervous system. Carcinogenic health effects refer to the development of cancer which may result from exposure to a substance. Following U.S. EPA guidance (U.S. EPA, 1989), these two effects (non-carcinogenic and carcinogenic) are evaluated separately.

- **Chronic Non-Carcinogenic Health Effects:** U.S. EPA has established chronic non-carcinogenic health criteria termed reference doses (RfDs) for oral and dermal exposure routes, and reference concentrations (RfCs) for the inhalation exposure route. The RfD and RfC are each a daily intake level for the human population, including sensitive subpopulations, that are not expected to cause adverse health effects over a lifetime of exposure (U.S. EPA, 1989). It should be noted that RfDs and RfCs are generally very conservative (i.e., health protective) due to the use of large uncertainty factors.
- **Carcinogenic Health Effects:** U.S. EPA has established cancer toxicity values termed cancer slope factors (CSFs) for oral and dermal exposure routes, and unit risks (URs) for the inhalation exposure route. U.S. EPA uses both an alpha-numeric system and a weight-of-evidence-based descriptive narrative to describe the carcinogenic potential of an agent. Among the COPCs in soil at the Site, only arsenic is considered to be potentially carcinogenic to humans. Arsenic is classified by U.S. EPA as a Class A, human carcinogen.
- **Toxicity Values for Dermal Exposure:** Route-specific toxicity values are not available for the dermal pathway and are therefore extrapolated from the oral toxicity values using gastrointestinal absorption factors.
- **Sources of Dose-Response Values:** The sources used to identify dose-response values for this HHRA are consistent with U.S. EPA guidance (U.S. EPA, 2003). Toxicity values and their sources are provided in Appendix D.

6. Risk Characterization

The risk characterization provides a quantitative and qualitative discussion of the potential health hazards posed by the COPCs in environmental media for the receptor scenarios evaluated at the Site. The characterization of risks and hazards to future industrial workers and construction workers represent baseline risks under future conditions, with no remedial activities being performed.

6.1 RISK CHARACTERIZATION METHODOLOGY

Cancer risks associated with exposure to each COPC are calculated by multiplying the exposure route pathway-specific intake (e.g., oral exposure to soil) or exposure concentration (e.g., inhalation of dust) by its exposure route-specific CSF (e.g., oral CSF) or UR.

$$\textit{Intake (mg/kg/day or ug/m}^3\textit{) x CSF (mg/kg/day)}^{-1}\textit{ or UR (ug/m}^3\textit{)}^{-1} = \textit{ELCR}$$

The calculated value is an ELCR and represents an upper bound of the probability of an individual developing cancer over a lifetime as the result of exposure to a COPC. This process is repeated for all exposure pathways for each receptor at each exposure point.

Non-cancer risks associated with exposure to each COPC are calculated by dividing the exposure route pathway-specific intake (e.g., oral exposure to soil) or exposure concentration (e.g., inhalation of dust) by its exposure route-specific RfD or RfC.

$$\textit{Intake (mg/kg/day or ug/m}^3\textit{) / RfD (mg/kg/day) or RfC (ug/m}^3\textit{) = HQ}$$

The calculated value is a hazard quotient (HQ). Chemical-specific HQs are then summed among all exposure pathways for each receptor at each exposure point to produce a hazard index (HI). An HI less than 1 indicates that non-carcinogenic toxic effects are unlikely to occur as a result of COPC exposure. HIs greater than 1 may be indicative of a possible non-carcinogenic toxic effect. As the HI increases, so does the likelihood that adverse effects might be associated with exposure.

Risk calculations are presented in Appendix D.

An HI that is calculated by summing the HQs for all COPCs, which is termed a Screening Hazard Index, generally provides an overestimation of potential risk. This is because the critical effects upon which the RfD and RfC values are derived are not necessarily the same for all COPCs. For example, the critical effects for manganese are based on adverse effects to the central nervous system while the critical effect for arsenic is on adverse effects to the skin. Thus, summing arsenic and manganese HQs does not provide an accurate estimate of total HI for one effect or the other. Rather, it provides an overestimate of risk.

Consequently, a total HI that is above 1 and is based on exposures to multiple COPCs does not necessarily indicate that the potential for adverse health effects is unacceptable if the risks for the COPCs are not additive. Therefore, when HI values exceed 1, it is appropriate to conduct an additional evaluation to review the hazard quotient for each COPC individually, taking into consideration the effect of individual COPCs on target organs. Separate HI values for specific target organ effects may then be calculated and evaluated against the EPA goal of an HI of 1.
Results of the risk characterization for each receptor are discussed below.

6.2 RISK CHARACTERIZATION RESULTS

Total receptor ELCR and HI were compared to acceptable risk levels established in the National Contingency Plan (NCP; U.S. EPA, 1990). According to the NCP and U.S. EPA (1991) guidance "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," U.S. EPA uses a hazard index of unity (i.e., 1) and a 10^{-4} (one in ten-thousand) to 10^{-6} (one in a million) risk range as a "target range" within which the Agency strives to manage risks.

6.2.1 Future Industrial Worker

Industrial worker exposure to surface soil are associated with the following potential levels of risk:

Industrial Worker	Exposure Route	ELCR	Screening HI
Surface soil (0 to 2 ft bgs)	Incidental ingestion	1.4E-06	1.1
	Dermal absorption	2.9E-07	0.0018
	Dust inhalation	3.2E-09	0.099
	Vapor inhalation	NC	NC
		1.6E-06	1.2

The cancer risks are below the NCP risk range of 10^{-6} to 10^{-4} and the Screening HI is 1.2. HI values are further evaluated by target organ effect in Table 4. As indicated in Table 4, all of the target organ HI values are below 1.

6.2.2 Future Re-development Construction Worker

Construction worker exposure to surface and subsurface soil are associated with the following potential levels of risk:

Re-development Construction Worker	Exposure Route	ELCR	Screening HI
Total soil (0 to 10 ft bgs)	Incidental ingestion	1.4E-07	1.5
	Dermal absorption	2.2E-08	0.0036
	Dust inhalation	7.5E-10	0.53
	Vapor inhalation	NC	NC
		1.6E-07	2.1

The cancer risks are below the NCP risk range of 10^{-6} to 10^{-4} and the Screening HI is 2.1. HI values are further evaluated by target organ effect in Table 4. As shown in Table 4, all target organ HI values are below 1 except for CNS effects, which is an HI of 1.5.

The HI for CNS effects is contributed by manganese, with an incidental soil ingestion HQ of 1.0 and a particulate inhalation HQ of 0.5. The HQ associated with the inhalation exposure pathway likely over-states the potential hazard to construction workers associated with exposure to manganese in Site soil because:

- The RfC for manganese is based epidemiological studies that examined workers exposed to manganese oxide fumes in a battery manufacturing plant. Potential exposure to manganese in Site soil is associated with manganese adsorbed to soil particulates. Manganese entrained in soil particulates would have a lower absorption through lung tissue than manganese oxide fumes.

- The RfC for manganese includes a 1000-fold uncertainty factor, indicating that there is an abundance of protection built into the toxicity value.
- The particulate emissions to which a construction worker is modeled to be exposed to are based on a hypothetical model which estimates particulate generation through various mechanical soil excavation activities. Furthermore, it is unlikely that a construction worker would be exposed to the concentration of soil particulates assumed in the risk assessment continuously for the duration of the construction project.

Overall, these conditions suggest that an HI of 1.5 for construction worker exposure to manganese in Site soil is unlikely to be indicative of a significant health risk.

Construction worker exposure to groundwater was evaluated by deriving risk-based concentrations (Appendix D) and comparing them to groundwater EPCs. Arsenic and benzene were the only two constituents detected in recent groundwater sampling at concentrations above the Tier 1A screening levels. However, risk-based screening levels were also developed for tetrachloroethene, trichloroethene, and iron to provide perspective on groundwater analytical results. Tetrachloroethene and trichloroethene were previously detected at location IFW-02-00023 (September 1998) at concentrations above Tier 1A screening levels, but were not detected in recent sampling of the nearby monitoring well IMW-02-00004S/D. A Tier 1A screening level was not previously identified for iron. As shown in Table 5, maximum detected groundwater concentrations were below risk-based screening levels for the construction worker scenario. Therefore, on-site groundwater does not pose significant risks to a future construction worker.

6.3 RISK ASSESSMENT QUALITATIVE UNCERTAINTY ANALYSIS

This section identifies and discusses uncertainties in the risk assessment. These uncertainties are identified to place the results in context or perspective. The following types of uncertainties should be considered in any human-health risk evaluation:

- Uncertainties in the nature and extent of the release of a COPC;
- Uncertainties associated with estimating the frequency, duration, and magnitude of possible exposure;
- Uncertainties associated with assigning exposure parameters to a heterogeneous population that includes both men and women and young and old (e.g., body weight and ingestion rates);
- Uncertainties in estimating CSFs and URs and/or non-carcinogenic measures of toxicity (e.g., RfDs or RfCs); and
- Uncertainties about possible synergistic or antagonistic chemical interactions of a chemical mixture.

These generic uncertainties, which are applicable to all risk assessments, are not evaluated in this uncertainty analysis. Rather, this uncertainty analysis evaluates site-specific uncertainties that could have a bearing on the interpretation of the risk assessment results. The following presents a consideration of the HHRA-specific uncertainties.

6.3.1 Hazard Identification

Analytical Detection Limits. Analytical detection limits for arsenic and thallium are greater than industrial RSLs based on 1E-06/HI=0.1 target risks. However, both of those metals were retained as COPCs, and analytical detection limits have been included in the derivation of the EPCs. Therefore, elevated detection limits for arsenic and thallium do not represent an uncertainty that would have a bearing on the results of the risk assessment.

6.3.2 Exposure Assessment

Particulate Emissions during Construction Activities. The EPC for inhalation of dust by re-development construction workers was derived by combining the soil EPCs with a particulate emission factor. The particulate emission factor was derived using models that predict dust emissions that result from various mechanical soil excavation and grading activities. There are a number of uncertainties associated with this modeling that can affect the particulate emission estimates, including the silt fraction and moisture content of soil, number of times that the Site area is dozed and graded, number of times soil is dumped, and Site area over which these activities occur. These parameters affect the emission modeling results as follows:

- Doubling soil moisture content reduces emissions estimates 14%;
- Doubling acreage increases emissions estimates 16%; and
- Doubling the frequency of mechanical activities increases emissions estimates 28%.

While the silt and moisture content of the soil could be measured, the nature of any future site re-development is not known. Therefore, the area over which mechanical soil disturbance may occur, and frequency of mechanical disturbance activities, can only be estimated.

More significantly, the model expresses emissions estimates as an average value over the total time period that construction activities occur. This means that the dust emission is assumed to occur continuously over the duration of the construction project. In reality, activities that involve mechanical agitation of soil are episodic in nature. Consequently, potential exposures to dust emissions associated with mechanical agitation of soil occur episodically, and are therefore representative of acute exposures, as opposed to the subchronic exposures that are modelled for the construction worker exposure scenario.

6.3.3 Toxicity Assessment

COPCs Lacking Dose-Response Values. Dose-response values are published in sources approved by U.S. EPA are not published for methyl cyclohexane, carbazole, and sulfide, and only a subchronic RfD is published for dimethyl phthalate. Lack of dose-response values can result in underestimation of risks. However, the potential risks associated with the constituents can be gauged by review of toxicity values and RSLs for chemicals that are structurally similar.

- Methyl cyclohexane: An RSL is available for cyclohexane. The value (310 mg/kg at an HI of 0.1) is orders of magnitude higher than the concentration detected in Site soil (0.12 mg/kg), suggesting that methyl cyclohexane is unlikely to pose a health risk of concern.
- Carbazole: Historically, the Health Effects Assessment Summary Tables (HEAST) provided an oral CSF for carbazole of 2E-02 per mg/kg/day. If this CSF was applied, the industrial soil RSL would be approximately 115 mg/kg. The maximum detected concentration of carbazole in Site soil is 0.12 mg/kg. Therefore, carbazole would not pose a health risk of concern.
- Dimethyl phthalate: Using the subchronic RfD that has been published as a provisional peer reviewed toxicity value (PPRTV), the dimethyl phthalate HQ for the construction worker is 3E-06. Even if large uncertainty factors were applied to the subchronic RfD to derive a chronic RfD, the HQ for the industrial worker would be orders of magnitude below 1. Therefore, lack of a chronic RfD for dimethyl phthalate does not affect the conclusions of the risk assessment.

- Sulfide: An RSL is available for sulfur trioxide. The value (600,000 mg/kg at an HI of 0.1) is orders of magnitude higher than the concentration detected in Site soil (1500 mg/kg), suggesting that sulfide is unlikely to pose a health risk of concern.

In addition, RfC values are available for arsenic and manganese, but the values published in U.S. EPA approved sources are chronic values. The re-development construction worker scenario, for which potential inhalation exposures are more significant than for the industrial worker scenario, is a subchronic exposure scenario. Application of chronic toxicity values to evaluate subchronic exposure represents a conservative approach that is likely to overestimate risk.

6.3.4 Risk Characterization

Overall, the risks to a re-development construction worker associated with potential inhalation exposures to manganese in particulates is over-stated in this HHRA because:

- Dust emissions associated with mechanical agitation of soil would occur episodically over short periods of time, and therefore represent a series of acute exposures. However, the exposure is modelled as a subchronic exposure (i.e., occurring continuously, 8 hours per day, 5 days per week, for 50 weeks).
- The inhalation toxicity value for manganese is a chronic value that is based on health effects observed in workers who were exposed to manganese oxide fumes, not to manganese entrained in soil particulates. The exposure regime that forms the basis of the toxicity study is not consistent with the exposure regime evaluated in this risk assessment, and a chronic toxicity value is being used to evaluate inhalation exposures that are likely to be acute in nature.
- The inhalation toxicity value was derived by incorporating a 1000-fold uncertainty factor, indicating that there is an abundance of conservatism in the toxicity value.

Consequently, the inhalation HQ of 0.5 estimated for the re-development construction worker likely over-states the potential risk associated with dust inhalation exposures to soil at the Site.

7. Conclusions

This risk assessment was performed in a manner consistent guidance provided in U.S. EPA's *Risk Assessment Guidance for Superfund* (RAGS) document series (U.S. EPA, 1989; 2004; 2009). The risk assessment incorporates the soil and groundwater verification sampling data collected at the IHLC during the investigation conducted in 2019. This risk assessment has been performed to determine if, under future industrial land use conditions, potentially complete exposure pathways are associated with health risks that meet EPA risk management criteria.

The risk assessment provided documentation that the only potentially complete exposure pathways to Site-related constituents are associated with:

- Future industrial worker, potentially exposed to surface soil (zero to two feet bgs) via incidental ingestion, dermal absorption, and dust and vapor inhalation.
- Future re-development construction worker, potentially exposed to total soil (zero to ten feet bgs) via incidental ingestion, dermal absorption, and dust and vapor inhalation, and to groundwater via incidental ingestion and dermal absorption.

Incomplete or insignificant exposure pathways at the Site, which were not further evaluated in this risk assessment, include:

- Potable or non-potable uses of groundwater. Extraction and use of groundwater for any purposes is prohibited, in accordance with the Institutional Controls.
- Direct contact with constituents in groundwater that may migrate to surface water. Constituents in groundwater are below risk-based screening levels protective for recreational and angling exposures to surface water, as well as aquatic life exposures to surface water.
- Vapor intrusion to indoor air from soil or groundwater. Considering the significant size, air infiltration, and natural ventilation of the current property building, any potential effects of vapor intrusion of vapor-forming chemicals will be mitigated via dilution.

Furthermore, the risk assessment documented that there are no potentially complete exposure pathways to off-Site receptors, including industrial workers and construction/utility workers at neighboring properties, and aquatic life in adjacent surface water bodies.

Based on the estimated hazards and risks, future use of the Site for industrial development is associated with health risks that meet the U.S. EPA acceptable risk goals as follows:

- Industrial Worker: incidental ingestion, dermal absorption, and dust and vapor inhalation exposure to surface soil (zero to two feet bgs). Incremental lifetime cancer risks are within the NCP range of 10^{-6} to 10^{-4}, and hazard index values are below 1.
- Re-development Construction Worker: incidental ingestion, dermal absorption, and dust and vapor inhalation exposure to soil (zero to ten feet bgs). Incremental lifetime cancer risks are below 10^{-6}, and the hazard index value is 1.5.
- Re-development Construction Worker: incidental ingestion and dermal absorption exposure to groundwater: Maximum detected groundwater concentrations are below risk-based screening levels.

The hazard index of 1.5 for the re-development construction worker is associated with manganese, for which an HQ of 1 for incidental ingestion and an HQ of 0.5 for dust inhalation were calculated. The HQ associated with dust inhalation represents a very conservative estimate of inhalation hazard because the chronic inhalation toxicity value for manganese is a chronic value, but it is being used to evaluate dust inhalation exposures to construction workers that are episodic, and therefore acute in nature.

8. References

1. AECOM, Phase II RCRA Facility Investigation Interior Source Area Report, January 2012.

2. AECOM, Phase II RCRA Facility Investigation Report, Facility Perimeter Areas, September 2009.

3. ArcelorMittal USA LLC, Response to Comments; Data Sufficiency Evaluation, 11 January 2019.

4. Earth Tech, Documentation of Environmental Indicator Determination, 2005.

5. Haley & Aldrich, Inc. (2018). RCRA Facility Investigation Data Sufficiency Evaluation, May 2018.

6. Haley & Aldrich, Inc. (2019). RCRA Facility Investigation Data Summary Report, May 2019

7. United States District Court for the Northern District of Indiana, Consent Decree, 1993.

8. United States Environmental Protection Agency [U.S. EPA] (1989). "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final", Office of Emergency and Remedial Response, Washington, D.C; December 1989. EPA/540/1-89/002.

9. United States Environmental Protection Agency [U.S. EPA] (1990). "Code of Federal Regulations, Title 40, Part 300, National Oil and Hazardous Substances Pollution Contingency Plan"; Federal Register; March 8.

10. United States Environmental Protection Agency [U.S. EPA] (1991). "Role of the Baseline Risk Assessment in the Superfund Remedy Selection Process"; Office of Emergency and Remedial Response; OSWER 9355.0-30.

11. United States Environmental Protection Agency [U.S. EPA] (2002a). *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*. Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December 2002.

12. United States Environmental Protection Agency [U.S. EPA] (2002b). *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*. Office of Solid Waste and Emergency Response/Office of Solid Waste and Remedial Response; OSWER 9285.6-10; December 2002.

13. United States Environmental Protection Agency [U.S. EPA] (2003). "Human Health Toxicity Values in Superfund Risk Assessments" (OSWER No. 9285.7-53, December 2003).

14. United States Environmental Protection Agency [U.S. EPA] (2004). Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment, OSWER 9285.7-02EP, July 2004, final. Washington, D.C.

15. United States Environmental Protection Agency [U.S. EPA] (2009). *Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual, Part F. Supplemental Guidance for Inhalation Risk Assessment*, EPA-540-R-070-002, OSWER 9285.7-82. January 2009, final. Washington, D.C.

16. United States Environmental Protection Agency [U.S. EPA] (2016a), Resource Conservation and Recovery Act Facilities Investigation Remedy Selection Track – A Toolbox for Corrective Action, May 2016.

17. United States Environmental Protection Agency [U.S. EPA].(2016b). Software for Calculating Upper Confidence Limits. ProUCL Version 5.1.002. https://www.epa.gov/land-research/proucl-version-5100-documentation-downloads

18. United States Environmental Protection Agency [U.S. EPA] (2019a). Comments on Verification Sampling – Indiana Harbor Long Carbon, May 2019.

19. United States Environmental Protection Agency [U.S. EPA] (2019b). Mid-Atlantic Risk Assessment Regional Screening Levels (RSLs). U.S. EPA Environmental Protection Agency. May 2019.

TABLES

TABLE 1
SUMMARY OF EXPOSURE PATHWAYS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

Exposure Medium [a]	Receptor	Exposure Pathway	Pathway Potentially Complete?	Rationale
On-Site Surface Soil	Industrial Worker	Incidental ingestion, dermal absorption, dust and vapor inhalation	Yes	Under future use conditions as commercial/industrial property, workers may contact constituents in surface soil during routine work.
	Re-development Construction Worker	Incidental ingestion, dermal absorption, dust and vapor inhalation	Yes	Under future use conditions, re-development construction workers may contact surface soil during subsurface excavation activities.
	Terrestrial birds and mammals	Incidental ingestion, food chain uptake	No	The facility is industrial and does not provide any terrestrial habitat.
On-Site Subsurface Soil	Industrial Worker	Incidental ingestion, dermal absorption, dust and vapor inhalation	No	Under future use conditions, commercial/industrial workers would not be engaged in subsurface excavation activities, and will therefore not contact subsurface soil.
	Re-development Construction Worker	Incidental ingestion, dermal absorption, dust and vapor inhalation	Yes	Under future use conditions, re-development construction workers may contact subsurface soil during subsurface excavation activities.
	Terrestrial birds and mammals	Incidental ingestion, food chain uptake	No	The facility is industrial and does not provide any terrestrial habitat.
OnSite Groundwater [b]	Industrial Worker	Ingestion, dermal absorption	No	Under future conditions, use of groundwater for potable and non-potable purposes is prohibited by institutional controls
	Re-development Construction Worker	Ingestion, Dermal absorption	Yes	Recent groundwater sampling verified previous conditions; however, arsenic and benzene were detected in groundwater at concentrations above Tier 1A human health screening values.
Surface Water (via migraiton of groundwater to surface water) [b]	Recreational Users	Incidental ingestion and dermal contact with groundwater that migrates to surface water	No	There are no on-site surface waterss at the IHLC property. Recent groundwater sampling verified previous conditions; constituents were not detected in groundwater at concentrations above Tier 1A and/or 1B human health and ecological screening values.
	Aquatic Life	Direct exposure to groundwater that migrates to surface water	No	
Sediment	Recreational Users	Incidental ingestion and dermal contact with groundwater that migrates to surface water	No	There are no on-site surface waters and thus, no associated on-site sediments at the IHLC property. The U.S. EPA and ArcelorMittal have agreed that relative to RCRA Corrective Action at the IHE facility, assessment of the IHSC and Indiana Harbor sediments is not relevant because sheet pile revetments are in place and are maintained by ArcelorMittal to prevent future impacts to the IHSC from the IHE facility.
	Aquatic Life	Direct exposure to groundwater that migrates to surface water	No	
Indoor Air	Industrial Worker	Inhalation	No	Considering the significant size, air infiltration, and natural ventilation of the current property building, any potential effects of vapor intrusion of vapor-forming chemicals will be mitigated via dilution. Therefore, the vapor intrusion pathway is considered to be insignificant.
Outdoor Air	Industrial Worker	Inhalation	No	VOCs have not been detected in groundwater or soil at concentrations that would cause them to be a source of emissions to outdoor air.

Notes:
[a] Exposure pathways are not complete for off-site soil or groundwater as discussed in Section 3 of the report; therefore those media are not presented in this table.
[b] Tier 1A, Tier 1B, and ecological screening values were presented in the Data Summary Report (Haley & Aldrich, May 2019) and are provided in Appendix A.
Tier 1A screening values for the construction worker were based on IDEM Industrial Use Closure Levels for groundwater, which are protective for use groundwater as a drinking water at insubstantial facilities.
Tier 1A screening levels for recreational users were based on IDEM Ambient Surface Water Quality Criteria for non-drinking water use or the National Recommended Water Quality Criteria,
both of which are protective for swimming and ingestion of fish.
Tier 1B screening criteria were the Tier 1A screening criteria multiplied by a dilution-attenuation factor of 10 to account for dispersion of constituents when groundwater migrates to surface water.

TABLE 2
SUMMARY OF SURFACE SOIL DATA (0-2 FT BGS), SELECTION OF COPCs AND EPCs
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

Parameter	Frequency of Detection	Range of Reporting Limits for Non-Detects	Range of Detected Concentrations	May 2019 Industrial Soil RSL (HI = 0.1, ELCR = 1e-06)	Selected as a COPC?		95% UCL	95% UCL Statistic	EPC
Volatile Organic Compounds (ug/kg)									
1,1,1-Trichloroethane	1 / 11	250 - 360	65 - 65	3600000 ns	No	BSL			na
Benzene	2 / 11	250 - 360	8.4 - 15	5100 c**	No	BSL			na
Ethylbenzene	2 / 11	250 - 360	18 - 19	25000 c*	No	BSL			na
Methyl acetate	3 / 11	1300 - 1800	530 - 2100	120000000 nms	No	BSL			na
Methyl cyclohexane	1 / 11	500 - 720	80 - 80		Yes	NSL		NC	80
Naphthalene	2 / 11	250 - 360	170 - 190	17000 c**	No	BSL			na
Tetrachloroethene	5 / 11	250 - 360	29 - 190	39000 n	No	BSL			na
Toluene	1 / 11	250 - 360	83 - 83	4700000 ns	No	BSL			na
Xylene (total)	2 / 11	500 - 720	26 - 85	250000 n	No	BSL			na
Semi-Volatile Organic Compounds (ug/kg)									
2-Methylnaphthalene	11 / 11		8.5 - 150	300000 n	No	BSL			na
Acenaphthene	10 / 11	16 - 16	13 - 95	4500000 n	No	BSL			na
Acenaphthylene	9 / 11	80 - 81	4.5 - 220	2300000 n	No	BSL			na
Acetophenone	2 / 11	110 - 540	22 - 54	12000000 ns	No	BSL			na
Anthracene	11 / 11		14 - 360	23000000 n	No	BSL			na
Benzaldehyde	2 / 11	110 - 540	63 - 69	820000 c*	No	BSL			na
Benzo(a)anthracene	11 / 11		62 - 1100	21000 c	No	BSL			na
Benzo(a)pyrene	11 / 11		58 - 1400	2100 c*	No	BSL			na
Benzo(b)fluoranthene	11 / 11		120 - 1900	21000 c	No	BSL			na
Benzo(g,h,i)perylene	11 / 11		67 - 1400	2300000 n	No	BSL			na
Benzo(k)fluoranthene	10 / 11	81 - 81	29 - 680	210000 c	No	BSL			na
Biphenyl	1 / 11	54 - 270	27 - 27	20000 n	No	BSL			na
bis(2-Ethylhexyl)phthalate	6 / 11	150 - 380	56 - 400	160000 c*	No	BSL			na
Carbazole	6 / 11	54 - 270	35 - 120		Yes	NSL	103	95% KM (t) UCL	103
Chrysene	11 / 11		88 - 1400	2100000 c	No	BSL			na
Dibenz(a,h)anthracene	8 / 11	16 - 81	33 - 370	2100 c	No	BSL			na
Dibenzofuran	9 / 11	54 - 270	36 - 120	100000 n	No	BSL			na
Dimethyl phthalate	1 / 11	75 - 380	70 - 70		Yes	NSL		NC	70
Fluoranthene	11 / 11		130 - 4300	3000000 n	No	BSL			na
Fluorene	9 / 11	16 - 42	15 - 76	3000000 n	No	BSL			na
Indeno(1,2,3-cd)pyrene	11 / 11		44 - 1200	21000 c	No	BSL			na
Naphthalene	11 / 11		13 - 200	17000 c**	No	BSL			na
Phenanthrene	11 / 11		71 - 1000	2300000 n	No	BSL			na
Phenol	1 / 11	54 - 270	23 - 23	25000000 n	No	BSL			na
Pyrene	11 / 11		150 - 3400	2300000 n	No	BSL			na
Other (mg/kg)									
Sulfide	11 / 11		41 - 1500		Yes	NSL	980	95% Adjusted Gamma UCL	980

TABLE 2
SUMMARY OF SURFACE SOIL DATA (0-2 FT BGS), SELECTION OF COPCs AND EPCs
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

Parameter	Frequency of Detection	Range of Reporting Limits for Non-Detects	Range of Detected Concentrations	May 2019 Industrial Soil RSL (HI = 0.1, ELCR = 1e-06)	Selected as a COPC?		95% UCL	95% UCL Statistic	EPC
Inorganic Compounds (mg/kg)									
Antimony	5 / 11	0.9 - 17	0.39 - 2.6	47 n	No	BSL			na
Arsenic	5 / 11	4.5 - 22	0.7 - 5.6	3 c*R	Yes	ASL	4.94	95% KM (t) UCL	4.94
Barium	11 / 11		32 - 300	22000 n	No	BSL			na
Beryllium	11 / 11		0.28 - 6.6	230 n	No	BSL			na
Cadmium	10 / 11	3.3 - 3.3	0.072 - 1.5	98 n	No	BSL			na
Chromium	11 / 11		22 - 1100	180000 n	No	BSL			na
Cobalt	11 / 11		0.67 - 6.1	35 n	No	EN			na
Copper	11 / 11		6.5 - 140	4700 n	No	BSL			na
Cyanide	11 / 11		0.43 - 2.3	15 n	No	BSL			na
Iron	11 / 11		6100 - 210000	82000 n	Yes	ASL	94823	95% Student's-t UCL	94823
Lead	11 / 11		6 - 170	800 G	No	BSL			na
Magnesium	11 / 11		16000 - 37000		No	EN			na
Manganese	11 / 11		540 - 16000	2600 n	Yes	ASL	11557	95% Adjusted Gamma UCL	11557
Mercury	8 / 11	0.11 - 0.12	0.019 - 0.17	4.6 ns	No	BSL			na
Nickel	11 / 11		3.6 - 72	2200 n	No	BSL			na
Selenium	3 / 11	1.6 - 32	1.4 - 4.6	580 n	No	BSL			na
Silver	10 / 11	0.53 - 0.53	0.46 - 2.9	580 n	No	BSL			na
Sodium	11 / 11		150 - 1300		No	EN			na
Thallium	1 / 11	1 - 22	6.7 - 6.7	1.2 n	Yes	ASL		NC	6.7
Tin	10 / 11	9.2 - 9.2	4.4 - 15	70000 n	No	BSL			na
Vanadium	11 / 11		17 - 540	580 n	No	BSL			na
Zinc	11 / 11		23 - 340	35000 n	No	BSL			na

Abbreviations
ASL = above screening level
BSL = below screening level
COPC = compound of potential concern
ELCR = Excess Lifetime Cancer Risk
EN = essential nutrient
EPC = exposure point concentration
HI = Hazard index
mg/kg = milligram per kilogram
na = not applicable
NA = not available
NSL = no screening level available
RSL = Regional Screening Level
UCL = Upper Confidence Limit
ug/kg = microgram per kilogram

RSLs: Regional Screening Levels are the Industrial Soil values, based on a cancer risk of 1E-06 and a hazard index of 0.1, and were obtained from United States Environmental Protection Agency Regions 3, 6, and 9, Regional Screening Table, http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm, updated May 2019.
c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer
s = Concentration may exceed chemical saturation limit (See RSL User Guide)
L = see RSL user guide on lead ; R = RBA applied (See User Guide for Arsenic notice)
Pyrene RSL used as a surrogate for Acenaphthylene, Benzo(ghi)perylene, and Phenanthrene.
Trivalent chromium RSL used as a surrogate for Chromium, Total.
The RSL value for lead is not reduced by a factor of 10 because lead risk is not additive with other COPCs.

COPCs: A compound was selected as a COPC if the maximum detected level exceeded the Industrial RSL or if no screening level was available. Analytical data are provided in Appendix B.

EPCs: EPCs are the lower value of either the calculated 95% Upper Confidence Limit (95%UCL), or the maximum detected concentrations of COPCs. 95%UCLs are calculated using 2016 EPA ProUCL software, version 5.1.002. See Appendix C.

TABLE 3
SUMMARY OF TOTAL SOIL DATA (0-10 FT BGS), SELECTION OF COPCs AND EPCs
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

Parameter	Frequency of Detection	Range of Reporting Limits for Non-Detects	Range of Detected Concentrations	May 2019 Industrial Soil RSL (HI = 0.1, ELCR = 1e-06)	Selected as a COPC?		95% UCL	95% UCL Statistic	EPC
Volatile Organic Compounds (ug/kg)				`					
1,1,1-Trichloroethane	1 / 22	250 - 360	65 - 65	3600000 ns	No	BSL			na
Benzene	2 / 22	250 - 360	8.4 - 15	5100 c**	No	BSL			na
Ethylbenzene	3 / 22	250 - 360	18 - 26	25000 c*	No	BSL			na
Methyl acetate	3 / 22	1200 - 1800	530 - 2100	120000000 nms	No	BSL			na
Methyl cyclohexane	2 / 22	500 - 720	80 - 120		Yes	NSL	134	95% KM (t) UCL	120
Naphthalene	2 / 22	250 - 360	170 - 190	17000 c**	No	BSL			na
Tetrachloroethene	5 / 22	250 - 360	29 - 190	39000 n	No	BSL			na
Toluene	2 / 22	250 - 360	83 - 110	4700000 ns	No	BSL			na
Xylene (total)	3 / 22	500 - 720	26 - 180	250000 n	No	BSL			na
Semi-Volatile Organic Compounds (ug/kg)									
2-Methylnaphthalene	18 / 22	17 - 18	8.5 - 150	300000 n	No	BSL			na
Acenaphthene	13 / 22	16 - 18	13 - 95	4500000 n	No	BSL			na
Acenaphthylene	10 / 22	16 - 81	4.5 - 220	2300000 n	No	BSL			na
Acetophenone	3 / 22	110 - 540	16 - 54	12000000 ns	No	BSL			na
Anthracene	19 / 22	17 - 18	4.6 - 360	23000000 n	No	BSL			na
Benzaldehyde	2 / 22	110 - 540	63 - 69	820000 c*	No	BSL			na
Benzo(a)anthracene	20 / 22	16 - 17	13 - 1100	21000 c	No	BSL			na
Benzo(a)pyrene	21 / 22	17 - 17	15 - 1400	2100 c*	No	BSL			na
Benzo(b)fluoranthene	21 / 22	17 - 17	15 - 1900	21000 c	No	BSL			na
Benzo(g,h,i)perylene	21 / 22	17 - 17	12 - 1400	2300000 n	No	BSL			na
Benzo(k)fluoranthene	17 / 22	16 - 81	9.9 - 680	210000 c	No	BSL			na
Biphenyl	1 / 22	53 - 270	27 - 27	20000 n	No	BSL			na
bis(2-Ethylhexyl)phthalate	7 / 22	75 - 380	56 - 400	160000 c*	No	BSL			na
Carbazole	10 / 22	53 - 270	25 - 120		Yes	NSL	67.2	95% KM (t) UCL	67.2
Chrysene	20 / 22	16 - 17	13 - 1400	2100000 c	No	BSL			na
Dibenz(a,h)anthracene	14 / 22	16 - 81	13 - 370	2100 c	No	BSL			na
Dibenzofuran	13 / 22	53 - 270	20 - 120	100000 n	No	BSL			na
Dimethyl phthalate	1 / 22	75 - 380	70 - 70		Yes	NSL		NC	70
Fluoranthene	22 / 22		6.9 - 4300	3000000 n	No	BSL			na
Fluorene	13 / 22	16 - 42	4.9 - 78	3000000 n	No	BSL			na
Indeno(1,2,3-cd)pyrene	19 / 22	16 - 17	13 - 1200	21000 c	No	BSL			na
Naphthalene	18 / 22	17 - 18	10 - 200	17000 c**	No	BSL			na
Phenanthrene	20 / 22	17 - 17	15 - 1000	2300000 n	No	BSL			na
Phenol	2 / 22	53 - 270	23 - 45	25000000 n	No	BSL			na
Pyrene	22 / 22		7.1 - 3400	2300000 n	No	BSL			na
Other (mg/kg)									
Sulfide	17 / 22	32 - 36	19 - 1500		Yes	NSL	622	95% KM (Chebyshev) UCL	622

TABLE 3
SUMMARY OF TOTAL SOIL DATA (0-10 FT BGS), SELECTION OF COPCs AND EPCs
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

Parameter	Frequency of Detection	Range of Reporting Limits for Non-Detects	Range of Detected Concentrations	May 2019 Industrial Soil RSL (HI = 0.1, ELCR = 1e-06)	Selected as a COPC?		95% UCL	95% UCL Statistic	EPC
Inorganic Compounds (mg/kg)									
Antimony	8 / 22	0.84 - 17	0.39 - 2.6	47 n	No	BSL			na
Arsenic	16 / 22	4.5 - 22	0.7 - 5.9	3 c*R	Yes	ASL	3.81	95% KM (t) UCL	3.81
Barium	22 / 22		2.6 - 300	22000 n	No	BSL			na
Beryllium	17 / 22	0.49 - 0.56	0.047 - 6.6	230 n	No	BSL			na
Cadmium	20 / 22	0.22 - 3.3	0.057 - 1.5	98 n	No	BSL			na
Chromium	22 / 22		4.1 - 1100	180000 n	No	BSL			na
Cobalt	22 / 22		0.67 - 6.1	35 n	No	BSL			na
Copper	22 / 22		1.3 - 140	4700 n	No	BSL			na
Cyanide	12 / 22	0.5 - 0.6	0.22 - 2.3	15 n	No	BSL			na
Iron	22 / 22		3500 - 210000	82000 n	Yes	ASL	82856	95% Chebyshev (Mean, Sd) UCL	82856
Lead	22 / 22		2.1 - 170	800 G	No	BSL			na
Magnesium	22 / 22		590 - 37000		No	EN			na
Manganese	22 / 22		120 - 16000	2600 n	Yes	ASL	7942	95% Chebyshev (Mean, Sd) UCL	7942
Mercury	9 / 22	0.11 - 0.13	0.019 - 0.17	4.6 ns	No	BSL			na
Nickel	22 / 22		2.3 - 72	2200 n	No	BSL			na
Selenium	7 / 22	1.3 - 32	0.5 - 4.6	580 n	No	BSL			na
Silver	20 / 22	0.44 - 0.53	0.13 - 2.9	580 n	No	BSL			na
Sodium	21 / 22	470 - 470	73 - 1300		No	EN			na
Thallium	2 / 22	0.84 - 22	4.8 - 6.7	1.2 n	Yes	ASL	2.36	95% KM (t) UCL	2.36
Tin	15 / 22	8.6 - 11	3 - 15	70000 n	No	BSL			na
Vanadium	22 / 22		7.8 - 540	580 n	No	BSL			na
Zinc	22 / 22		11 - 340	35000 n	No	BSL			na

Abbreviations
ASL = above screening level
BSL = below screening level
COPC = compound of potential concern
ELCR = Excess Lifetime Cancer Risk
EN = essential nutrient
EPC = exposure point concentration
HI = Hazard index
mg/kg = milligram per kilogram
na = not applicable
NA = not available
NSL = no screening level available
RSL = Regional Screening Level
UCL = Upper Confidence Limit
ug/kg = microgram per kilogram

RSLs: Regional Screening Levels are the Industrial Soil values, based on a cancer risk of 1E-06 and a hazard index of 0.1, and were obtained from United States Environmental Protection Agency Regions 3, 6, and 9, Regional Screening Table, http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm, updated May 2019.
c = cancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; n = noncancer
s = Concentration may exceed chemical saturation limit (See RSL User Guide)
L = see RSL user guide on lead ; R = RBA applied (See User Guide for Arsenic notice)
Pyrene RSL used as a surrogate for Acenaphthylene, Benzo(ghi)perylene, and Phenanthrene.
Trivalent chromium RSL used as a surrogate for Chromium, Total.
The RSL value for lead is not reduced by a factor of 10 because lead risk is not additive with other COPCs.

COPCs: A compound was selected as a COPC if the maximum detected level exceeded the Industrial RSL or if no screening level was available. Analytical data are provided in Appendix B.

EPCs: EPCs are the lower value of either the calculated 95% Upper Confidence Limit (95%UCL), or the maximum detected concentrations of COPCs. 95%UCLs are calculated using 2016 EPA ProUCL software, version 5.1.002. See Appendix C.

TABLE 4
CALCULATION OF HAZARD INDEX VALUES BY TARGET ORGAN EFFECT
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

COPC	RfD/RfC UF	Critical Effect	Target Organ	RfD/RfC source	Industrial Worker HQ	Construction Worker HQ
Manganese	3 (RfD); 1000 (RfC)	CNS Effects	Nervous system	IRIS	0.5	1.5
			HI - Nervous system		0.5	1.5
Arsenic	3 (chronic RfD); 10 (subchronic RfD)	Keratosis and hyperpigmentation	Skin	IRIS	0.01	0.03
Thallium	3000 (chronic RfD); 1000 (subchronic RfD)	Histopathology	Skin	PPRTV	0.6	0.2
			HI - Skin		0.6	0.2
Iron	1.5 (chronic RfD)	Gastrointestinal effects	GI system	PPRTV	0.1	0.4
			HI - GI system		0.1	0.4
Dimethylphthalate	3000 (subchronic RfD)	Increased absolute and relative liver weight	Liver	PPRTV	NC	0.000003
			HI - Liver			0.000003

Abbreviations:
COPC = contaminant of potential concern
HQ - hazard quotient
HI - hazard index
NC - not calculated
IRIS - Integrated Risk Information System, United States Environmental Protection Agency (https://www.epa.gov/iris)
PPRTV = Provisional Peer Reviewed Toxicity Values (PPRTVs) derived by the EPA Superfund Health Risk Technical Support Center (STSC) for the EPA Superfund program
RfD/RfC UF = reference dose/reference concentration uncertainty factor

Notes:
Hazard quotient calculations provided in Appendix D-1 (industrial worker) and D-2 (construction worker).

TABLE 5
COMPARISON OF GROUNDWATER DATA TO SCREENING LEVELS FOR A CONSTRUCTION WORKER
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA
FILE NO. 129719

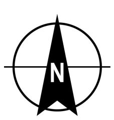
COPC	Maximum Concentration	Location (Date)	Construction Worker Screening Level (cancer)	(non-cancer)
Arsenic	22	P-02B (1991)	1,010	648
Iron	7,580	IMW-02-00004D (6/2009)	NC	1,000,000
Benzene	3,300	IMW-03-00004 (4/2019)	5,810	4,560
Tetrachloroethene	187	IFW-02-00023 (9/98)	68,700	20,600
Trichloroethene	45	IFW-02-00023 (9/98)	8,020	265

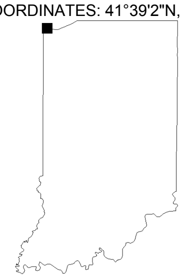
Abbreviations:
COPC = contaminant of potential concern
NC = not carcinogenic
Notes:
Construction Worker Screening Levels are provided in Appendix D-3, and are based on a target cancer risk of 1E-05 and a target hazard quotient of 1.

FIGURES

MAP SOURCE: ESRI

SITE COORDINATES: 41°39'2"N, 87°27'10"W





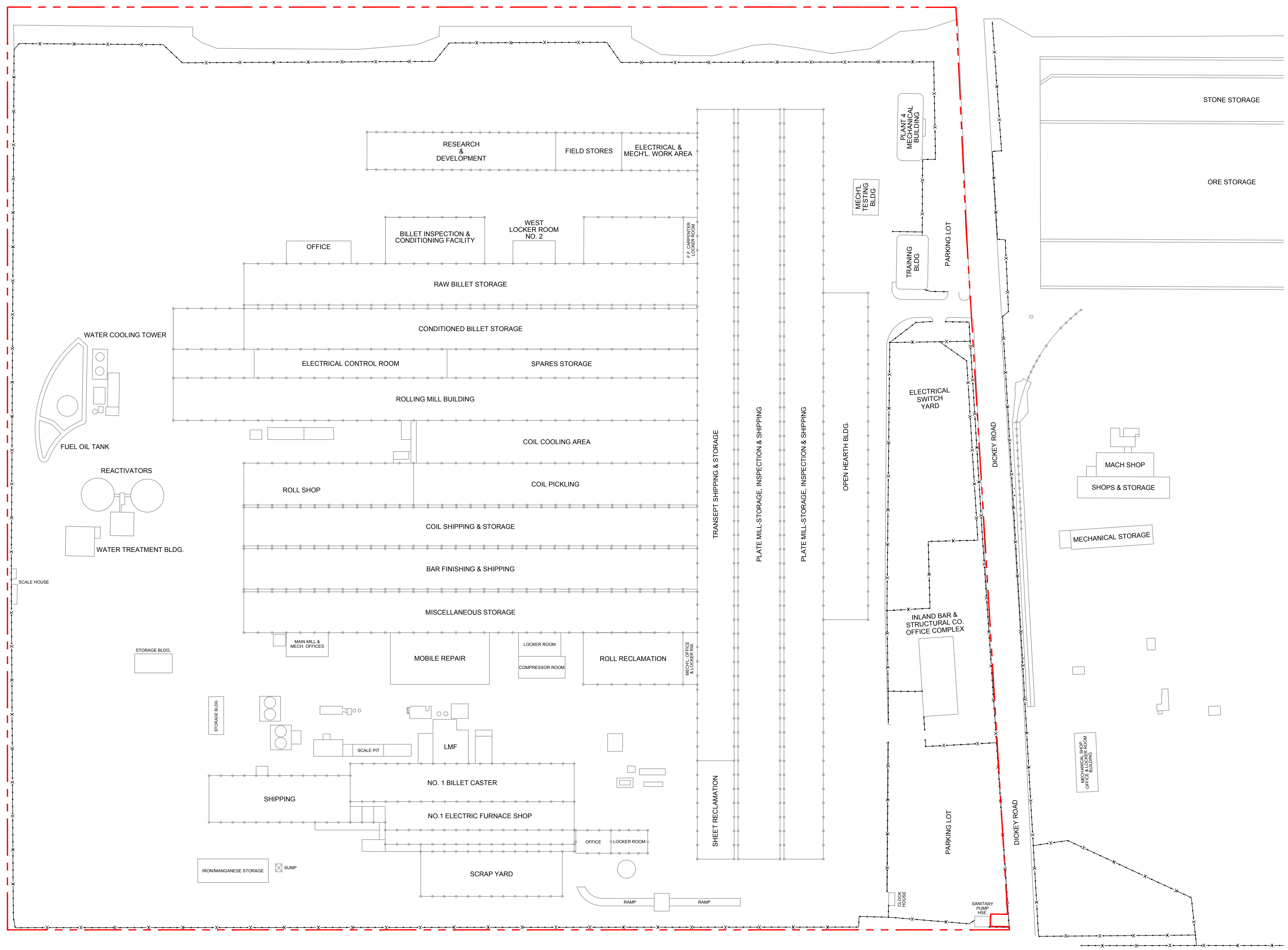
ARCELORMITTAL USA LLC
INDIANA HARBOR LONG CARBON
3300 DICKEY ROAD
EAST CHICAGO, INDIANA

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
JUNE 2019

FIGURE 1

129719_1_LOCUS.PDF



LEGEND

FENCE LINE

COLUMN

PROPERTY LINE (APPROXIMATE)

NOTES

1. PLAN BASED ON SURVEY AND BASE MAP ENTITLED "UTILITIES_BASE_IHE_2017_V2010.DWG" PROVIDED BY AECOM ON 24 AUGUST 2017.

0 250 500

SCALE IN FEET

HALEY ALDRICH

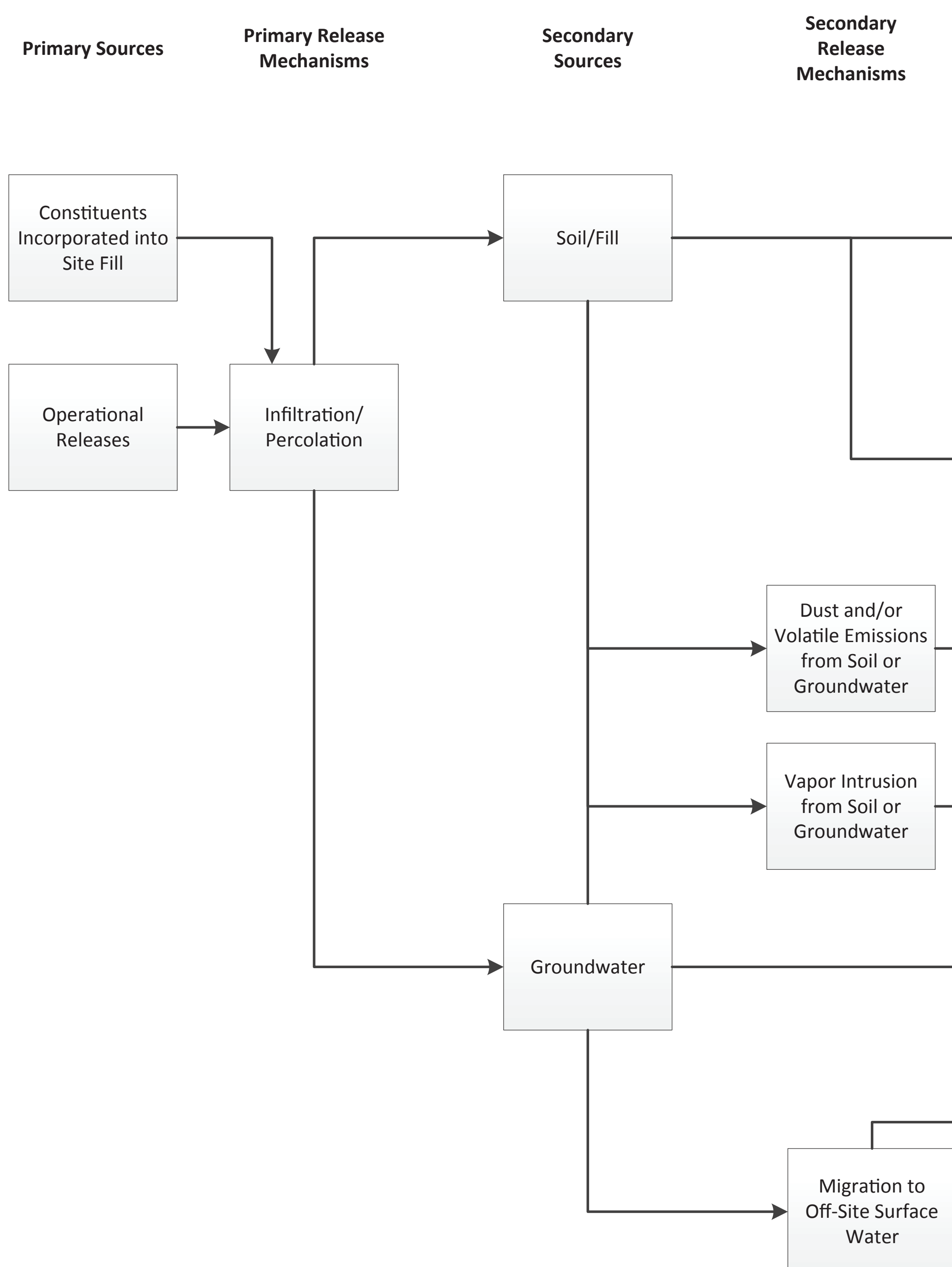
ARCELORMITTAL INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

SITE PLAN

SCALE: AS SHOWN
JUNE 2019

FIGURE 2

O'BRIEN, JANET Printed: 3/1/2018 12:52 PM Layout: FIG2
G:\129719 - ARCELORMITTAL, INDIANA HARBOR RCRA CA\GLOBAL\CAD\129719_000_FIG5.DWG



Potential Exposure Media	Potential Human Health Receptors				Potential Human Health Receptors				
	Potential Exposure Route	Indoor Industrial Worker	Outdoor Industrial Worker	Construction Worker	Indoor Industrial Worker	Outdoor Industrial Worker	Construction Worker	Recreational Receptor	Recreational Fisher
Surface Soil	Incidental Ingestion	NA	●	●	NA	○	○	NA	NA
	Dermal Contact	NA	●	●	NA	○	○	NA	NA
	Inhalation of Dust and Vapor	NA	●	●	NA	○	○	NA	NA
Subsurface Soil	Incidental Ingestion	NA	NA	●	NA	NA	○	NA	NA
	Dermal Contact	NA	NA	●	NA	NA	○	NA	NA
	Inhalation of Dust and Vapor	NA	NA	●	NA	NA	○	NA	NA
Outdoor Air	Inhalation	NA	○	○	NA	○	○	NA	NA
Indoor Air	Inhalation	○	NA	NA	○	NA	NA	NA	NA
Groundwater	Incidental Ingestion	NA	NA	○	NA	NA	○	NA	NA
	Dermal Contact	NA	NA	○	NA	NA	○	NA	NA
Off-Site Surface Water	Incidental Ingestion	NA	NA	NA	NA	NA	NA	○	○
	Dermal Contact	NA	NA	NA	NA	NA	NA	○	○
Off-Site Fish Tissue	Inhalation	NA	NA	NA	NA	NA	NA	NA	○

● Pathway potentially complete and evaluated in risk assessment.
○ Pathway evaluated and found to be incomplete; no further evaluation recommended.
NA Not Applicable – Receptor not assumed to be potentially exposed via this pathway.

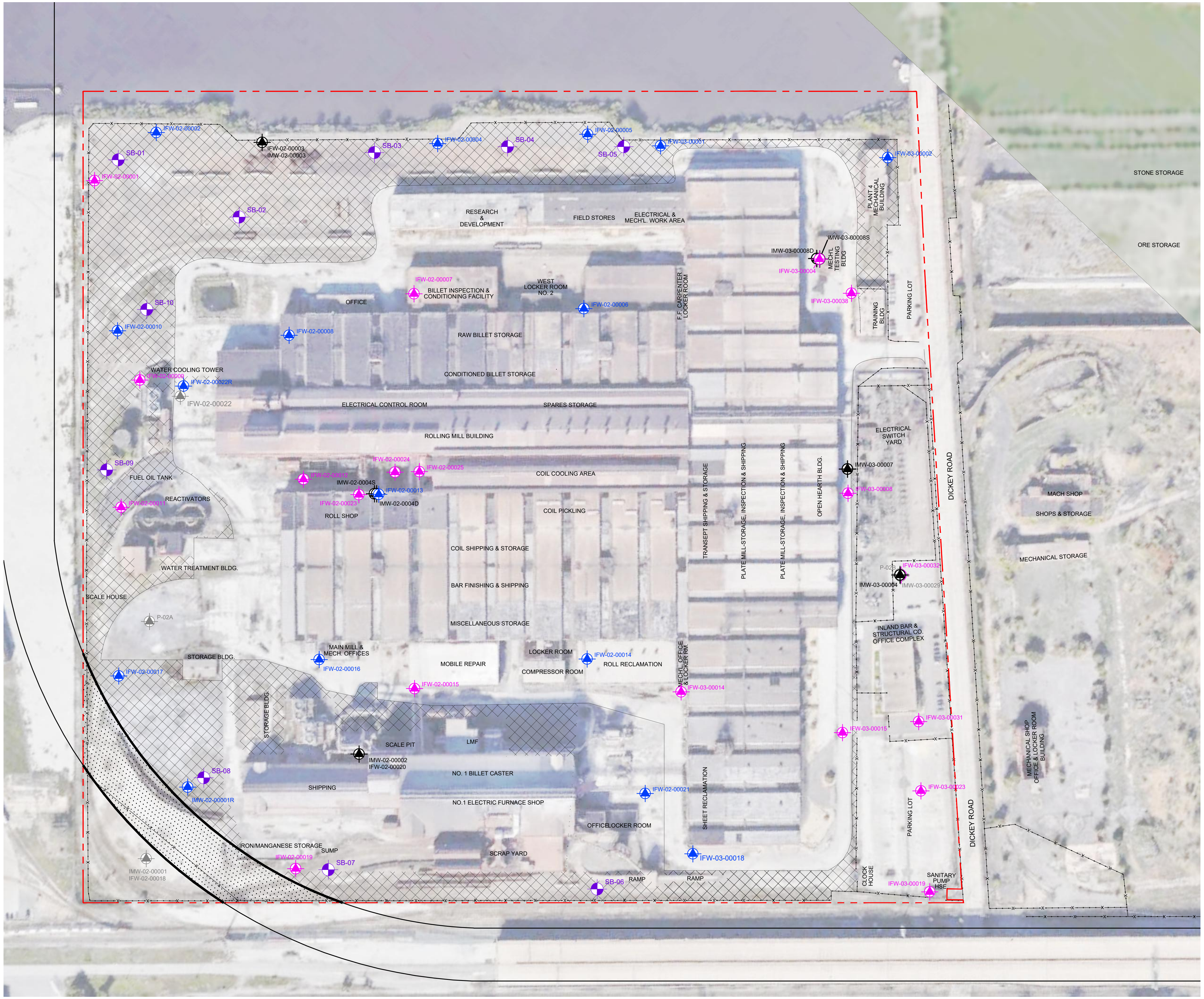
HALEY ALDRICH

ARCELORMITTAL INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

HUMAN HEALTH
CONCEPTUAL SITE MODEL

MAY 2019

FIGURE 3



LEGEND

- IMW-03-00010S — MONITORING WELL LOCATION
- P-02B — MONITORING WELL ABANDONED
- IFW-02-00006 — FIRST WATER SAMPLE CONVERTED TO PIEZOMETER
- IFW-03-00038 — FIRST WATER SAMPLING LOCATION
- SB-05 — PROPOSED SOIL BORINGS
- FENCE LINE
- PROPERTY LINE (APPROXIMATE)
- UNPAVED AREAS
- CLINE AVENUE BRIDGE, LLC PROPERTY

NOTES

1. PLAN BASED ON SURVEY AND BASE MAP ENTITLED "UTILITIES_BASE_IHE_2017_V2010.DWG" PROVIDED BY AECOM ON 24 AUGUST 2017.

DRAFT

HALEY ALDRICH

ARCELORMITTAL INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

SOIL BORING AND MONITORING WELL LOCATIONS PLAN

SCALE: AS SHOWN
JULY 2019

FIGURE 4

VARI, KATALIN Printed: 7/22/2019 4:32 PM Layout: L
G:\129719 - ARCELORMITTAL, INDIANA HARBOR RCRA CA\GLOBAL\CAD\FIGURES\129719_007_FIG X_SB-MW LOC.DWG

APPENDIX A

Summary of Groundwater Analytical Results from the DSR

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	Groundwater to Surface Water Discharge Exposure Pathway				Industrial/Commercial Exposure to Groundwater																				
	Human Receptors		Ecological Receptors	Wildlife	Tier1A[4]		Tier 1B[6]	Tier 1B[6] Non-Default	Tier 1B[6]	IFW-02-00001	IFW-02-00002	IFW-02-00003	IFW-02-00003	IFW-02-00004	IFW-02-00005	IFW-02-00006	IFW-02-00007	IFW-02-00008	IFW-02-00009	IFW-02-00010	IFW-02-00011	IFW-02-00012	IFW-02-00012	IFW-02-00013	IFW-02-00014
	Tier 1A Carcinogen[1]	Tier 1A Non-Carcinogen[1]	Tier1A[2]	Tier1A[3]	Carcinogen	Non-Carcinogen	Human Screening Criteria	Human Screening Criteria	Ecological Screening Criteria	4/28/1998 Primary	4/24/1998 Primary	IMW-02-00003 5/1/1998 Duplicate	IMW-02-00003 5/1/1998 Primary	4/22/1998 Primary	4/28/1998 Primary	4/21/1998 Primary	4/21/1998 Primary	4/21/1998 Primary	4/14/1998 Primary	4/24/1998 Primary	4/15/1998 Primary	4/23/1998 Duplicate	4/23/1998 Primary	5/6/1998 Primary [a]	4/23/1998 Primary
Inorganic Compounds (ug/L)																									
Antimony, Total	-	2000	80	-	-	41	-	-	-	-	-	ND (250)	ND (250)	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	230	147.9	-	1.9	-	2300	-	-	-	-	ND (5)	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Total	-	1000	1001.11 (IHSC)	-	-	20000	-	-	-	-	-	**88**	**87**	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium, Total	-	300	17.10 (IHSC)	-	-	200	-	-	-	-	-	ND (3)	ND (3)	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	1400	4.54 (IHSC)	-	-	51	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	-	25000 [5]	10.98 [5]	-	-	310 [5]	250000	-	109.8	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt, Total	-	-	19	-	-	-	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Copper, Total	-	56000	18.14 (IHSC)	-	-	4100	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide	-	48000	5.2	-	-	2000	480000	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	300	1000	-	-	-	3000	183906	10000	-	-	**895 [B]**	**870 [B]**	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	-	-	17.29 (IHSC)	-	-	42	-	-	-	-	-	ND (5)	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium, Total	-	-	-	-	-	-	-	-	-	-	-	**28300**	**27500**	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	50	1048.1 (IHSC)	-	-	2450	500	30651	10481	-	-	**514 [BG]**	**501 [BG]**	-	-	-	-	-	-	-	-	-	-	-	-
Mercury, Total	-	0.0018	0.9081	0.0013	-	31	-	-	-	-	-	ND (0.5)	ND (0.5)	-	-	-	-	-	-	-	-	-	-	-	-
Nickel, Total	-	42000	100.76 (IHSC)	-	-	2000	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Total	-	3400	5	-	-	510	-	-	-	-	-	ND (5)	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Total	-	26000	0.12	-	-	510	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	-	-	-	-	-	-	-	-	-	**80600**	**79500**	-	-	-	-	-	-	-	-	-	-	-	-
Thallium, Total	-	5	6	-	-	7.2	-	-	-	-	-	ND (2) J	ND (2) J	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	180	-	12000	-	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium, Total	-	2300	12	-	86	-	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-
Zinc, Total	-	250000	231.67 (IHSC)	-		31000	-	-	-	-	-	ND (30)	ND (30)	-	-	-	-	-	-	-	-	-	-	-	-
Other (ug/L)																									
Ammonia (as N)	-	-	2065 (IHSC)	-	-	-	-	-	20650	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness as CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab) (pH units)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids (TSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (ug/L)																									
4,4'-DDD	0.0031	-	0.032	0.000011	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	0.00015	0.002	0.032	0.000011	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	0.026	-	12.4	-	0.45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1016 (PCB-1016)	0.0000068	-	0.014	0.00012	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	0.0000068	-	0.014	0.00012	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	0.0000068	-	0.014	0.00012	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	0.5	667	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	-	170	0.05	-	-	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	0.193	0.036	-		31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	0.5	0.11	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.0016	0.29	0.0038	-	0.31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.00039	-	0.0038	-	0.31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/L)																									
1,2,4,5-Tetrachlorobenzene	-	0.36	8.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	35	30	-	-	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	6000	14	-	-	9200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	320	52	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dinitrobenzene	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	63	16	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Naphthoquinone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	-	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	2500	1.9	-	-	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	200	-	1.4	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	450	17	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	8700	21	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	2800	19	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	1.1	-	44	-	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorophenol	-	450	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	-	81	-	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Acetylaminofluorene	-	-	535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	1000	0.396	-	-	8200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	81	24	-	-	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	330	-	-	410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	-	44000	67	-	-	5100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Picoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	0.95	-	4.5	-	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3-Dimethylbenzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	-	-	0.0891	-	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	-	44000	67	-	-	5100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	13	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Aminobiphenyl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3000	34.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	-	232	-	-	410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	44000	53	-	-	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitro-2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-Dimethylbenz(a)anthracene	-	-	-	0.548	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a,a-Dimethylphenethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	4200	27	-	-	4200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	4840	-	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	-	-	-	-	10200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	-	-	4.1	-	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	630	0.68	-	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	0.038	-	0.025	-	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.096	-	0.014	-	0.039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	0.038	-	9.07	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	7.64	-	0.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	0.038	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	-	-	8.6	-	-	31000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	0.3	-	19000	-	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate**	2.8	60	0.3	-	200	-	28	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	-	1500	23	-	-	2700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	-	-	7.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	0.038	-	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diallate	-	-	-	-	5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	0.038	-	-	-	0.039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	-	7.3	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	1200000	110	-	-	82000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	270000	1000	-	-	1000000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	-	31	19	-	-	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	-	-	30	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dinoseb	-	69	0.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diphenylamine	-	-	412	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disulfoton	-	-	0.0402	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Famphur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	9.5	3.6	-	-	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	320	2.4	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	0.00045	0.046	0.0003	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	0.24	-	0.053	-	-	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	-	1500	77	-	-	610	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	6.7	7.6	8	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.038	-	4.31	-	0.022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	110000	830	-	3000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methapyrilene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	1900	26	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	28000	220	-	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiethylamine	0.18	-	768	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodimethylamine	0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-N-butylamine	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	2.9	-	-	-	0.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	74	-	25	-	580	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosomethylethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosomorpholine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosopyrrolidine	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o,o,o-Triethylphosphorothioate	-	-	58.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-DIMETHYLAMINOAZOBENZENE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobenzene	-	0.18	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	84	24000	1130.56 (IHSC)	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenacetin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	0.93	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	2300	180	-	5800	3100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phorate	-	-	3.62	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Phenylenediamine	-	-	-	-	3800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pronamide	-	-	-	-	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	15	0.3	-	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyridine	-	-	2380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Safrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfotep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thionazin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																									
1,1,1,2-Tetrachloroethane	-	-	-	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	410	-	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	17	-	100	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	3000	87	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	27000	740	-	-	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	-	4100	210	-	-	5100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	0.17	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	210	-	980	-	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	5	-	360	-	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	1300	14000	-	-	61000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	99	-	-	6100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	-	-	170	-	-	8200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	220000	1700	-	-	92000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetonitrile	-	-	12000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acrolein	-	190	0.19	-	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acrylonitrile	3	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	310	510	98	-	52	-	-	-	-	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
Bromodichloromethane	150	13000	-	-	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	710	8100	61	-	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	-	16	-	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	100000	15	-	-	16000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	19	120	40	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	-	3200	47	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	1700	11000	170	-	80	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroprene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	-	620	-	-	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	170	46000	1.9	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	86	12000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	-	9100	110	-	-	10000	-	-	-	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)
Iodomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	-	-	2800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	2600	90000	1500	-	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	1900	26	-	-	2000	-	-	-	ND (17)	ND (17) J	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
Propionitrile (Ethyl cyanide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	-	32000	32	-	-	20000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	60	1700	60	-	55	-	-	-	-	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16) J	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	**127 [ACE]**	ND (16)
Toluene	-	51000	94	-	-	8200	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,2-Dichloroethene	-	25000	560	-	-	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	170	46000	1.9	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	370	-	260	-	-	31	-	-	-	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15) J	ND (15) J
Trichlorofluoromethane (CFC-11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	248	-	-	100000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	14	4900	930	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	-	150000	35	-	-	20000	-	-	-	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	IFW-02-00015 4/17/1998 Primary	IFW-02-00016 4/15/1998 Primary	IFW-02-00017 4/14/1998 Primary	IFW-02-00018 IMW-02-00001 4/29/1998 Primary	IMW-02-00001R 3/7/2019 Primary	IFW-02-00019 4/10/1998 Primary	IFW-02-00020 4/29/1998 Primary	IFW-02-00021 4/23/1998 Primary	IFW-02-00022 4/21/1998 Primary	IFW-02-00022R N 3/8/2019 Primary	IFW-02-00022R FD 3/8/2019 Primary	IFW-02-00023 9/28/1998 Primary [a]	IFW-02-00024 9/29/1998 Primary	IFW-02-00025 9/29/1998 Primary	IFW-03-00001 7/9/1996 Primary	IFW-03-00002 7/8/1996 Primary	IFW-03-00004 7/10/1996 Primary	IFW-03-00008 7/12/1996 Primary	IFW-03-00008 8/12/1996 Primary	IFW-03-00008 8/27/1996 Primary	IFW-03-00008 9/3/1996 Primary	IFW-03-00014 7/11/1996 Primary	IFW-03-00015 7/9/1996 Primary	IFW-03-00018 7/10/1996 Primary
Inorganic Compounds (ug/L)																								
Antimony, Total	-	-	-	ND (250)	ND (10)	-	ND (250)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	-	-	ND (5)	**12** [E]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Total	-	-	-	**107 J**	**32 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium, Total	-	-	-	ND (3)	ND (5)	-	ND (3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	-	-	ND (10)	**0.41 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	-	-	-	ND (50) J	**20** [C]	-	ND (50) J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt, Total	-	-	-	ND (50)	**0.93 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper, Total	-	-	-	ND (50) J	**17 J**	-	ND (50) J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron, Total	-	-	-	**24600 J** [BC]	**630** [B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	-	-	-	ND (5)	**23** [C]	-	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium, Total	-	-	-	**46500**	**18000**	-	**43000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	-	**378** [B]	**440** [B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury, Total	-	-	-	ND (0.5)	ND (0.2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel, Total	-	-	-	ND (50)	**6.8 J**	-	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Total	-	-	-	ND (5)	ND (15)	-	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Total	-	-	-	ND (50)	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	-	**70000**	**14000**	-	**24500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium, Total	-	-	-	ND (2)	**4 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	-	ND (50)	ND (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium, Total	-	-	-	ND (50)	**12 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc, Total	-	-	-	**32**	**54**	-	ND (30)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other (ug/L)																								
Ammonia (as N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness as CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab) (pH units)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids (TSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (ug/L)																								
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1016 (PCB-1016)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/L)																								
1,2,4,5-Tetrachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dinitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Naphthoquinone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Acetylaminofluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Picoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3-Dimethylbenzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylcholanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Aminobiphenyl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitro-2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a,a-Dimethylphenethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diallate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dinoseb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diphenylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disulfoton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Famphur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methapyrilene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-N-butylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosomethylethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosomorpholine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosopyrrolidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o,o,o-Triethylphosphorothioate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-DIMETHYLAMINOAZOBENZENE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenacetin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phorate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Phenylenediamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pronamide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyridine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Safrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfotep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thionazin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																								
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	-	-	-	-	-	ND (2)	ND (2)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acrolein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	ND (17)	ND (17)	ND (17)	ND (17)	-	ND (17)	ND (17)	ND (17)	ND (17)	**3.4**	**3.6**	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
Bromodichloromethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroprene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	**0.17 J**	**0.16 J**	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	**1.7**	**1.8**	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	-	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	**0.13 J**	**0.13 J**	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)
Iodomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	**10**	**10**	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	**3.3**	**3.6**	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	-	-	-	-	-	-	-	-	-	ND (5)	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	ND (17) J	ND (17)	ND (17)	ND (17)	-	ND (17)	ND (17)	ND (17)	**72.7** [C]	ND (1)	ND (1)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)
Propionitrile (Ethyl cyanide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	ND (16)	ND (16)	ND (16)	ND (16)	-	ND (16)	ND (16)	ND (16)	ND (16)	ND (1)	ND (1)	**187** [ACE]	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)
Toluene	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (1)	ND (1)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	ND (15) J	ND (15) J	ND (15) J	ND (15) J	-	ND (15)	ND (15)	ND (15)	ND (15)	-	-	**44.5** [F]	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)
Trichlorofluoromethane (CFC-11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	ND (17)	ND (17)	ND (17)	ND (17)	-	ND (17)	ND (17)	ND (17)	ND (17)	ND (2)	ND (2)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	IFW-03-00019	IFW-03-00023	IFW-03-00029	IFW-03-00029	IFW-03-00029	IFW-03-00029A	IFW-03-00029B	IFW-03-00029C	IFW-03-00029D	IFW-03-00029E	IFW-03-00031	IFW-03-00031	IFW-03-00032	IFW-03-00032	IFW-03-00038	IMW-02-00004D	IMW-02-00004D	IMW-02-00004S	IMW-02-00004S	IMW-02-00004S	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004
	7/8/1996 Primary	7/24/1996 Primary	7/22/1996 Primary	7/22/1996 Primary	8/26/1996 Primary	8/8/1996 Primary	8/8/1996 Primary	8/8/1996 Primary	8/9/1996 Primary	8/9/1996 Primary	7/30/1996 Primary	8/30/1996 Primary	8/6/1996 Primary	8/6/1996 Primary	9/3/1996 Primary	11/10/2008 Primary	6/10/2009 Primary	11/10/2008 Primary	6/10/2009 Primary	3/8/2019 Primary	8/5/1996 Primary	8/6/1996 Primary	8/13/1996 Primary	8/13/1996 Primary
			Analytical data replaced by IMW-03-00004										*Analytical data replaced by IMW-03-00004*											
Inorganic Compounds (ug/L)																								
Antimony, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4.8 JB**	ND (60)	**5.1 JB**	ND (60)	-	-	-	-	-
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**235**	**239**	**70.3 J**	**74.9 J**	-	-	-	-	-
Beryllium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5)	ND (5)	ND (5)	ND (5)	-	-	-	-	-
Chromium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	**2 J**	-	-	-	-	-
Copper, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7550 [BC]**	**7280 [BC]**	**206**	**228**	-	-	-	-	-
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**54600**	**58100**	**22600**	**25300**	-	-	-	-	-
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**84.4 [B]**	**91.1 [B]**	**474 [B]**	**593 [B]**	-	-	-	-	-
Mercury, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	-	-	-	-	-
Nickel, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (40)	ND (40)	ND (40)	ND (40)	-	-	-	-	-
Selenium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5)	ND (5)	ND (5)	ND (5)	-	-	-	-	-
Silver, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**46300**	**43800**	**92700**	**113000**	-	-	-	-	-
Thallium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
Zinc, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other (ug/L)																								
Ammonia (as N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3100 [C]**	**3600 [C]**	**500**	**500**	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**54100**	**69800**	**151000**	**126000**	-	-	-	-	-
Hardness as CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**680000**	**780000**	**310000**	**330000**	-	-	-	-	-
pH (lab) (pH units)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**347000**	**342000**	**148000**	**144000**	-	-	-	-	-
Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1000)	**1100**	ND (1000)	ND (1000)	-	-	-	-	-
Total Dissolved Solids (TDS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**980000**	**1000000**	**630000 J**	**720000**	-	-	-	-	-
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids (TSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12000**	**21000**	ND (4000)	ND (4000)	-	-	-	-	-
PCBs (ug/L)																								
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1016 (PCB-1016)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/L)																								
1,2,4,5-Tetrachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dinitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
1,4-Naphthoquinone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
2,4,5-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
2,4-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2,6-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2,6-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2-Acetylaminofluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	ND (100)	ND (100)	ND (100)	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2-Methylphenol (o-Cresol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
2-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Picoline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
3,3-Dimethylbenzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	50 R	ND (50)	50 R	-	-	-	-	-
3-Methylcholanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J	ND (10)	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
4-Aminobiphenyl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitro-2-Toluidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7,12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a,a-Dimethylphenethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Acetophenone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J	ND (10)	-	-	-	-	-
bis(2-Chloroethyl)ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diallate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10 R	ND (10)	10 R	ND (10)	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Dimethoate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Di-n-butylphthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Dinoseb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-
Diphenylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Disulfoton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
Ethyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Famphur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
Hexachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Hexachloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	ND (100)	ND (100)	ND (100)	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Isophorone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methapyrilene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methanesulfonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
N-Nitrosodiethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
N-Nitrosodimethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
N-Nitrosodi-N-butylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J	ND (10)	-	-	-	-	-
N-Nitrosodiphenylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
N-Nitrosomethylethylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
N-Nitrosomorpholine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10) J	ND (10)	ND (10) J	ND (10)	-	-	-	-	-
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosopyrrolidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o,o,o-Triethylphosphorothioate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-DIMETHYLAMINOAZOBENZENE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Phenacetin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Phenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Phorate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p-Phenylenediamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pronamide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-
Pyridine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-
Safrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-
Sulfotep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thionazin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-
Volatile Organic Compounds (ug/L)																								
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (1)	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1.8**	**0.86 J**	ND (1)	-	-	-	-
1,1-Dichloroethene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	**0.35 J**	-	ND (1)	-	-	-	-
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	ND (2)	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (1)	-	-	-	-
1,2-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	ND (1)	-	ND (1)	ND (1)	-	-	-	-
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (1)	-	-	-	-
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-
2-Hexanone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-
Acetone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-
Acetonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-
Acrolein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	-	-	-	-	-
Acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	-	-	-	-	-
Allyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2) J	-	-	-	-	-	-
Benzene	ND (17)	ND (17)	ND (17)	ND (17)	**1600 [ABCE]**	**22**	**20**	**9100 [ABCE]**	ND (17)	**4600 [ABCE]**	ND (17)	ND (17)	ND (17)	ND (17)	**300 [CE]**	ND (1)	ND (1)	-	ND (1)	ND (1)	**5900 [ABCE]**	**4700 [ABCE]**	**1400 [ABCE]**	**1600 [ABCE]**
Bromodichloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	ND (1)	ND (1) J	-	ND (1)	-	-	-	-
Bromoform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	ND (1)	-	-	-	-
Bromomethane (Methyl Bromide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	ND (1)	-	ND (1)	ND (1)	-	-	-	-
Carbon disulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	ND (1)	-	ND (1)	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (1)	-	-	-	-
Chlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	ND (1)	ND (1)	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	ND (1)	-	ND (1)	ND (1)	-	-	-	-
Chloroform (Trichloromethane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (1)	-	-	-	-
Chloromethane (Methyl Chloride)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (1)	-	-	-	-
Chloroprene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	ND (2)	-	ND (2)	-	-	-	-	-
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**230**	**280**	**28**	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	-	ND (1)	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1) J	-	ND (1) J	ND (1)	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1) J	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1) J	ND (1)	-	ND (1)	-	-	-	-
Ethyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-
Ethylbenzene	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	**21**	ND (8.2)	**13**	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	ND (8.2)	-	-	ND (1)	-	ND (1)	**18**	**15**	**8.4**	**8.6**
Iodomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	ND (1)	-	-	-	-	-
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-
Methyl acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
Methyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	2 R	ND (2)	-	-	-	-	-	-
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
Methylene chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	-	-	-
Naphthalene	ND (17)	ND (17)	**23**	**23**	**28 [C]**	ND (17)	ND (17)	**28 [C]**	ND (17)	**31 [C]**	ND (17)	ND (17)	**35 [C]**	**24**	ND (17)	-	-	-	-	ND (1)	**38 [C]**	**22**	**21**	ND (17)
Propionitrile (Ethyl cyanide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4 R	-	-	-	-	-	-
Styrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	ND (1)	ND (1)	-	-	-	-
Tetrachloroethene	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	-	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	ND (16)	-	-	**47 J**	**52**	**12**	ND (16)	ND (16)	ND (16)	ND (16)
Toluene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (1)	-	ND (1)	ND (10)	ND (10)	ND (10)	ND (10)
trans-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.5)	ND (0.5)	**10**	**8.3**	**0.68 J**	-	-	-	-
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1) J	-	ND (1) J	ND (1)	-	-	-	-
trans-1,4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 R	-	-	-	-	-	-
Trichloroethene	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (15)	ND (1)	ND (1)	**12**	**11**	**4.1**	ND (15)	ND (15)	ND (15)	ND (15)
Trichlorofluoromethane (CFC-11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-
Vinyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**220 [AE]**	**92 [AE]**	**0.31 J**	-	-	-	-
Xylene (total)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	-	ND (17)	ND (17)	ND (17)	ND (17)	ND (17)	ND (1)	ND (1)	ND (1)	-	ND (2)	ND (17)	ND (17)	ND (17)	ND (17)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00004	IMW-03-00007	IMW-03-00007	IMW-03-00007	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D
	9/23/2004	12/1/2004	1/27/2015	8/19/2015	1/20/2016	5/11/2016	10/12/2016	5/31/2017	1/24/2018	6/28/2018	6/28/2018	6/29/2018	4/23/2019	4/23/2019	8/8/1996	9/23/2004	12/1/2004	12/10/1999	10/19/2000	7/12/2001	7/10/2002	6/23/2003	11/10/2004	4/19/2005
	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Inorganic Compounds (ug/L)																								
Antimony, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	**2.8 J [E]**
Barium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**219**	**200**
Beryllium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5)	ND (5)
Cadmium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)
Cobalt, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (25)	ND (25)
Cyanide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)
Iron, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2860 [BC]**	**2240 [BC]**
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**81000**	**65000**
Manganese, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**130 [B]**	**105 [B]**
Mercury, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.2)	ND (0.2)
Nickel, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.7 J**	ND (40)
Selenium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1070000**	**1060000**
Thallium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	ND (100)
Vanadium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	ND (20)
Other (ug/L)																								
Ammonia (as N)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8500 [C]**	**7500 [C]**
Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2290000**	**2080000**
Hardness as CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab) (pH units)	**7.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8.7**	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**200000**	**198000**
Sulfide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1000)	ND (1000)
Total Dissolved Solids (TDS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4000000**	**3700000**
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids (TSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (ug/L)																								
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1016 (PCB-1016)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/L)																								
1,2,4,5-Tetrachlorobenzene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
1,2,4-Trichlorobenzene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,2-Dichlorobenzene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	ND (50)	ND (50)
1,3-Dichlorobenzene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-
1,3-Dinitrobenzene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)
1,4-Dichlorobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
1,4-Naphthoquinone	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-
2,2'-oxybis(1-Chloropropane)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-
2,3,4,6-Tetrachlorophenol	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	ND (50)	ND (50)
2,4,5-Trichlorophenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (20)	ND (10)	ND (10)	-	ND (10)	ND (10)
2,4,6-Trichlorophenol	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-
2,4-Dichlorophenol	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
2,4-Dinitrophenol	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
2,4-Dinitrotoluene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2,6-Dichlorophenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
2,6-Dinitrotoluene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)
2-Acetylaminofluorene	ND (100)	ND (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	-	-	-	-	-	ND (100)	ND (100)	ND (100)
2-Chloronaphthalene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	-
2-Chlorophenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	ND (10)	ND (10)
2-Methylnaphthalene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
2-Methylphenol (o-Cresol)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	-
2-Naphthylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
2-Nitroaniline	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	ND (50)	ND (50)	ND (50)
2-Nitrophenol	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (5)	-	ND (10)	ND (10)	-	-	-
2-Picoline	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
2-Toluidine	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
3,3'-Dichlorobenzidine	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	ND (50)	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
3,3-Dimethylbenzidine	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	ND (50)	ND (50)
3-Methylcholanthrene	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	-
3-Methylphenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)
3-Nitroaniline	-	-	ND (50)	ND (50)	50 R	ND (50)	ND (50) J	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	ND (50)	ND (50)	ND (50)	ND (50)	-	-
4,6-Dinitro-2-methylphenol	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	ND (50)	-	-	-	ND (50)	ND (50)	ND (50)
4-Aminobiphenyl	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	ND (50)	ND (50)
4-Bromophenyl phenyl ether	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
4-Chloro-3-methylphenol	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	-
4-Chloroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (20)	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	-
4-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-
4-Nitroaniline	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	ND (50)	ND (50)	ND (50)
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitro-2-Toluidine	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
7,12-Dimethylbenz(a)anthracene	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20) J	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
a,a-Dimethylphenethylamine	-	-	ND (50) J	ND (50) J	ND (50)	ND (50)	ND (50) J	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
Acenaphthene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Acenaphthylene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Acetophenone	-	-	**2.2 J**	**0.29 J**	ND (10)	ND (10)	**2.1 J**	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
Aniline	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
Anthracene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (80)	-	-	-	-	-
Benzo(a)anthracene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Benzo(a)pyrene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Benzo(b)fluoranthene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Benzo(g,h,i)perylene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Benzo(k)fluoranthene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-
Benzyl Alcohol	ND (10)	ND (10)	ND (10) J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	ND (20)	-	-	ND (10)	ND (10)	ND (10)
bis(2-Chloroethoxy)methane	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	ND (10)	ND (10)
bis(2-Chloroethyl)ether	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-
bis(2-Ethylhexyl)phthalate**	-	-	ND (10)	ND (10)	ND (10)	**11 JB [AC]**	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-
Butyl benzylphthalate	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
Chrysene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Diallate	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
Dibenz(a,h)anthracene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Dibenzofuran	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-
Diethyl phthalate	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Dimethoate	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
Dimethyl phthalate	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
Di-n-butylphthalate	-	-	ND (10)	**0.68 JB**	**0.68 JB**	**1.1 JB**	**2.2 JB**	**1.3 J**	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Di-n-octyl phthalate	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	ND (10)	ND (10)
Dinoseb	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	ND (20)	20 R	ND (20)
Diphenylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
Disulfoton	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	ND (50)	ND (50)	ND (50)
Ethyl methanesulfonate	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)
Famphur	-	-	10 R	10 R	ND (10) J	10 R	10 R	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
Fluoranthene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Fluorene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-
Hexachlorobenzene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-
Hexachlorobutadiene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-
Hexachlorocyclopentadiene	ND (50) J	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	50 R	-	-	ND (10)	ND (50)	ND (50)	ND (50)	50 R	ND (50)
Hexachloroethane	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)
Hexachloropropene	ND (100)	ND (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	-	-	-	-	-	ND (100)	ND (100)	ND (100)
Indeno(1,2,3-cd)pyrene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Isophorone	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-	-	-	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methapyrilene	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
Methyl methanesulfonate	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
Naphthalene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	-
Nitrobenzene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	ND (10)	ND (10)
N-Nitrosodiethylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
N-Nitrosodimethylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)
N-Nitrosodi-N-butylamine	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	-	ND (10)	ND (10)
N-Nitrosodiphenylamine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
N-Nitrosomethylethylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	ND (10)	ND (10)	ND (10)
N-Nitrosomorpholine	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosopyrrolidine	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
o,o,o-Triethylphosphorothioate	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
P-DIMETHYLAMINOAZOBENZENE	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
Pentachlorobenzene	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	ND (10)	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	ND (50)	ND (50)	ND (50)
Pentachlorophenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	ND (30)	-	-	ND (10)	ND (10)	ND (10)
Phenacetin	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	ND (20)	-	-
Phenanthrene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Phenol	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	**24**	**7.3 J**	ND (10)	ND (10)	**1.6 J**	**0.57 J**
Phorate	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
p-Phenylenediamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	-	-
Pronamide	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	-
Pyrene	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)
Pyridine	20 R	ND (20) J	-	-	-	-	-	-	-	-	-	-	-	-	-	20 R	-	-	-	-	-	-	ND (20)	ND (20)
Safrole	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	ND (20)	ND (20)
Sulfotep	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
Thionazin	ND (50)	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	ND (50)	ND (50)	ND (50)
Volatile Organic Compounds (ug/L)																								
1,1,1,2-Tetrachloroethane	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	ND (1)	-	-
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	ND (1)	-	ND (5)	-	-	ND (1)	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	-	-	-
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	ND (1)	-	-
1,1-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	ND (5)	-	-	-	ND (1)	ND (1)
1,2,3-Trichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	ND (1)	ND (1)	ND (1)
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	ND (1)	-	-
1,2-Dichloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND	ND	ND	ND	ND	-	ND (1)	-	-	ND (5)	ND (1)	-	-	ND (1)	ND (1)
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	-	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	10 R	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	ND (10)	ND (10)	ND (10)
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-
2-Hexanone	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10) J	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)
Acetone	**0.98 JB**	ND (10)	-	-	ND (10)	ND (10)	10 R	**3.6 JB**	-	-	-	-	-	-	-	**0.92 JB**	-	ND (10)	-	**0.77 J**	ND (10)	-	**1.4 JB**	ND (10)
Acetonitrile	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	ND (20)	ND (20)
Acrolein	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	ND (20)	ND (20)
Acrylonitrile	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	ND (20)	-	-	-	-	-	-	ND (20)	ND (20)
Allyl chloride	-	-	ND (2)	ND (2)	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	ND (2)	-	-
Benzene	ND (1)	ND (1)	-	-	**5.4**	**0.49 J**	**0.79 J**	**3.5**	**19000 [ABCE]**	**3400 [ABCE]**	**3200 [ABCE]**	**3300 [ABCE]**	**3100 [ABCE]**	**3300 [ABCE]**	**260 [CE]**	**5.9**	**6.2**	ND (5)	-	ND (1)	ND (1)	-	ND (1)	ND (1)
Bromodichloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	ND (5)	-	-	-	ND (1)	ND (1)
Bromoform	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	ND (1)	-	-
Bromomethane (Methyl Bromide)	ND (1) J	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1) J	-	ND (10)	-	ND (1)	ND (1)	-	ND (1)	ND (1) J
Carbon disulfide	**1.7**	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND	ND	ND	ND	ND	ND	-	**1.1**	-	-	ND (5)	-	-	-	**0.42 J**	**0.37 J**
Carbon tetrachloride	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	ND (1)	-	-
Chlorobenzene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	ND (5)	-	-	-	ND (1)	ND (1)
Chloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	1 R	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	ND (10)	-	ND (1)	ND (1)	-	ND (1)	ND (1)
Chloroform (Trichloromethane)	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (5)	-	-	ND (1)	-	-
Chloromethane (Methyl Chloride)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	**12**	ND (10)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Chloroprene	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	ND (2)	ND (2)	ND (2)
cis-1,2-Dichloroethene	-	-	ND (1)	ND (1)	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	ND (1)	ND (5)	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	ND (5)	ND (1)	-	ND (1)	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1) J	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	ND (1)	-	-
Dichlorodifluoromethane (CFC-12)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1) J	-	-	-	-	-	-	ND (1) J	ND (1) J
Ethyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Ethylbenzene	-	-	ND (1)	ND (1)	-	-	-	-	ND	ND	ND	ND	ND	ND	ND (8.2)	-	ND (1)	-	ND (5)	ND (1)	-	ND (1)	-	-
Iodomethane	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	ND (1)	1 R
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acrylonitrile	-	-	ND (2)	ND (2)	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	ND (2)	ND (2)	ND (2) J	ND (2)	ND (2)	ND (2) J	ND (2)	ND (2)	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	ND (2)	ND (2)	ND (2)
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	ND (1)	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (17)	-	-	-	-	-	-	-	-	-
Propionitrile (Ethyl cyanide)	-	-	4 R	4 R	-	-	-	-	-	-	-	-	-	-	-	-	ND (4)	-	-	-	-	ND (4)	-	-
Styrene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND	ND	ND	ND	ND	-	ND (1)	-	ND (5)	-	-	ND (1)	-	ND (1)	ND (1) J
Tetrachloroethene	-	-	ND (1)	ND (1)	-	-	-	-	ND	ND	ND	ND	ND	ND	ND (16)	-	ND (1)	ND (5)	-	-	-	-	-	-
Toluene	-	-	ND (1)	**0.73 J**	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	ND (1)	ND (5)	-	ND (1)	ND (1)	ND (1)	-	-
trans-1,2-Dichloroethene	ND (0.5)	ND (0.5)	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	-	-	-	-	-	-	-	ND (0.5)	-	-	ND (5)	-	-	-	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropene	ND (1) J	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1) J	-	ND (5)	-	-	ND (1)	-	ND (1) J	ND (1)
trans-1,4-Dichloro-2-butene	-	-	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	ND (1)	-	-
Trichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND	ND	ND	ND	ND	-	ND (1)	-	-	ND (5)	-	-	ND (1)	ND (1)	ND (1)
Trichlorofluoromethane (CFC-11)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	ND (1)	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	ND (2)	ND (2) J	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	ND (10)	-	-	-	ND (2)	-	-
Vinyl chloride	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	-	-	ND (1)	-	ND (10)	-	-	ND (1)	-	-
Xylene (total)	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND	ND	ND	ND	ND	-	ND (1)	-	-	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008D	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S
	10/12/2005 Primary	7/12/2006 Primary	6/18/2007 Primary	11/27/2007 Primary	9/30/2008 Primary	8/11/2009 Primary	10/12/2010 Primary	9/20/2011 Primary	10/1/2012 Primary	9/23/2013 Primary	8/25/2014 Primary	9/1/2015 Primary	9/20/2016 Primary	10/3/2017 Primary	9/24/2018 Primary	10/21/1998 Primary	11/19/1999 Primary	10/19/2000 Primary	7/10/2001 Primary	7/10/2002 Primary	6/23/2003 Primary	11/10/2004 Primary	4/19/2005 Primary
Inorganic Compounds (ug/L)																							
Antimony, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (60)	ND (60)
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (200)	ND (200)
Beryllium, Total	-	-	**0.48 JB**	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.29 JB**	ND (5)
Chromium, Total	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)
Copper, Total	-	-	ND (25)	ND (25)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide	-	-	ND (10)	**33 [C]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)
Iron, Total	-	-	**1270 [BC]**	**1310 [BC]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**607 [B]**	**1230 [BC]**
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium, Total	-	-	**36500**	**36100**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14300**	**19000**
Manganese, Total	-	-	**76.1 [B]**	**63.3 [B]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**110 [B]**	**174 [B]**
Mercury, Total	-	-	ND (0.2)	ND (0.2) J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.2)	ND (0.2)
Nickel, Total	-	-	ND (40)	ND (40)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (40)	ND (40)
Selenium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5)	ND (5)
Silver, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	**752000**	**826000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**87900**	**170000**
Thallium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	ND (100)	ND (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.87 J**	ND (50)
Zinc, Total	-	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other (ug/L)																							
Ammonia (as N)	-	-	**4800 [C]**	**6300 [C]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**200**	**200**
Chloride	-	-	**252000**	**1110000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**91900**	**176000**
Hardness as CaCO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**250000**	-
pH (lab) (pH units)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	**32200**	**151000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**65800**	**65700**
Sulfide	-	-	**1500**	ND (1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1000)	ND (1000)
Total Dissolved Solids (TDS)	-	-	**2200000**	**2100000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**700000**
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids (TSS)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (4000)	ND (4000)
PCBs (ug/L)																							
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1016 (PCB-1016)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatile Organic Compounds (ug/L)																							
1,2,4,5-Tetrachlorobenzene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-
1,2,4-Trichlorobenzene	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
1,2-Dichlorobenzene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	-	-	50 R	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	-	ND (50)	ND (50) J
1,3-Dichlorobenzene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
1,3-Dinitrobenzene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
1,4-Dichlorobenzene	-	-	ND (10)	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
1,4-Naphthoquinone	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	-
2,3,4,6-Tetrachlorophenol	-	-	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50) J
2,4,5-Trichlorophenol	-	-	ND (10)	ND (10)	-	-	-	ND (10) J	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
2,4,6-Trichlorophenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-
2,4-Dichlorophenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10) J	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
2,4-Dimethylphenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)	-	-
2,4-Dinitrophenol	-	-	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50) J	-	-	-	-	-	-	ND (50)	-	ND (50)	ND (50) J
2,4-Dinitrotoluene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
2,6-Dichlorophenol	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
2,6-Dinitrotoluene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10) J
2-Acetylaminofluorene	-	-	ND (100)	ND (100)	-	-	-	-	-	ND (100)	-	-	ND (100)	-	-	-	-	-	-	-	-	ND (100)	ND (100) J
2-Chloronaphthalene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-
2-Chlorophenol	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
2-Methylnaphthalene	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10) J
2-Methylphenol (o-Cresol)	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10) J	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
2-Naphthylamine	-	-	ND (10)	10 R	-	-	-	ND (10)	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
2-Nitroaniline	-	-	ND (50)	ND (50)	-	-	-	ND (50)	-	ND (50)	-	-	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	ND (50) J
2-Nitrophenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10) J	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (5)	ND (5)	-	ND (10)	ND (10)	-	-
2-Picoline	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-
2-Toluidine	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-
3,3'-Dichlorobenzidine	-	-	ND (50)	ND (50)	-	-	-	ND (50)	-	ND (50)	-	-	ND (50)	-	-	-	ND (50)	ND (50)	-	ND (50)	-	ND (50)	ND (50) J
3,3-Dimethylbenzidine	-	-	ND (50)	ND (50)	-	-	-	ND (50)	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	ND (50)	ND (50)	ND (50) J
3-Methylcholanthrene	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-
3-Methylphenol	-	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J
3-Nitroaniline	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	ND (50)	ND (50)	-	-
4,6-Dinitro-2-methylphenol	-	-	ND (50)	ND (50)	-	-	-	ND (50) J	-	ND (50)	-	-	ND (50)	-	-	-	ND (50)	ND (50)	ND (50)	-	-	ND (50)	ND (50) J
4-Aminobiphenyl	-	-	ND (50)	ND (50)	-	-	-	ND (50)	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	-	ND (50)	ND (50) J
4-Bromophenyl phenyl ether	-	-	ND (10)	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
4-Chloro-3-methylphenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10) J	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-
4-Chloroaniline	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	-	ND (20)	ND (20)	ND (10)	-	ND (10)	-	-
4-Chlorophenyl phenyl ether	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-
4-Methylphenol	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10) J	-	-	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
4-Nitroaniline	-	-	ND (50)	ND (50)	-	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	ND (50)	-	-	ND (50)	ND (50) J
4-Nitrophenol	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (100)	-	-
5-Nitro-2-Toluidine	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-
7,12-Dimethylbenz(a)anthracene	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-
a,a-Dimethylphenethylamine	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	50 R	ND (50)	-	ND (50) J	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
Acenaphthene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Acenaphthylene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Acetophenone	ND (10)	**0.56 J**	-	-	ND (10)	**0.35 J**	ND (10)	**0.38 J**	ND (10)	-	ND (10)	**0.56 J**	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-
Aniline	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-
Anthracene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
Benzo(a)pyrene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Benzo(b)fluoranthene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Benzo(g,h,i)perylene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10) J	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Benzo(k)fluoranthene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-
Benzyl Alcohol	-	-	ND (10)	ND (10)	-	-	-	ND (10) J	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
bis(2-Chloroethoxy)methane	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10) J
bis(2-Chloroethyl)ether	ND (10) J	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	-
bis(2-Ethylhexyl)phthalate**	ND (10)	**1.3 JB [C]**	-	-	**2.7 J [C]**	**0.93 JB [C]**	**2 JB [C]**	-	**5.1 JB [ACI]**	-	**5 JB [ACI]**	**1.9 JB [C]**	ND (10)	-	-	-	-	-	-	ND (10)	-	-	-
Butyl benzylphthalate	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	-	-	-	-
Chlorobenzilate	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-
Chrysene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Diallate	-	-	10 R	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
Dibenz(a,h)anthracene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Dibenzofuran	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
Diethyl phthalate	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Dimethoate	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10) J
Di-n-butylphthalate	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	**0.81 J**	-	ND (10)	**1.1 JB**	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Di-n-octyl phthalate	-	-	ND (10)	ND (10)	-	-	-	ND (10)	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10) J
Dinoseb	-	-	20 R	ND (20)	-	-	-	-	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-	-	20 R	ND (20) J
Diphenylamine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
Disulfoton	-	-	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	-	ND (50)	ND (50) J
Ethyl methanesulfonate	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J
Famphur	ND (10)	ND (10)	-	-	ND (10)	10 R	10 R	-	10 R	-	10 R	10 R	-	-	-	-	-	-	-	-	ND (10)	-	-
Fluoranthene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Fluorene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	-
Hexachlorobenzene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-	-
Hexachlorobutadiene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-
Hexachlorocyclopentadiene	-	-	50 R	50 R	-	-	-	-	-	50 R	-	-	ND (50)	-	-	-	-	-	-	ND (50)	-	50 R	ND (50) J
Hexachloroethane	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10) J
Hexachloropropene	-	-	ND (100)	ND (100)	-	-	-	-	-	ND (100)	-	-	ND (100)	-	-	-	-	-	-	-	-	ND (100)	ND (100) J
Indeno(1,2,3-cd)pyrene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Isophorone	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	-	-
Methapyrilene	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	-	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
Methyl methanesulfonate	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	-	-
Nitrobenzene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
N-Nitrosodiethylamine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
N-Nitrosodimethylamine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10) J	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J
N-Nitrosodi-N-butylamine	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-
N-Nitrosodi-n-propylamine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10) J
N-Nitrosodiphenylamine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
N-Nitrosomethylethylamine	-	-	ND (10)	ND (10)	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	ND (10)	ND (10) J
N-Nitrosomorpholine	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10) J
N-Nitrosopiperidine	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-	ND (10)	-	-
N-Nitrosopyrrolidine	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	ND (10)	-	-
o,o,o-Triethylphosphorothioate	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
P-DIMETHYLAMINOAZOBENZENE	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-
Pentachlorobenzene	ND (10)	ND (10)	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-
Pentachloronitrobenzene	-	-	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	-	ND (50)	ND (50) J
Pentachlorophenol	-	-	ND (10)	ND (10)	-	-	-	ND (10) J	-	ND (10)	-	-	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10) J
Phenacetin	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Phenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10) J
Phorate	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
p-Phenylenediamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pronamide	ND (20)	ND (20)	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	-	-
Pyrene	-	-	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	-	-	ND (10)	ND (10) J
Pyridine	-	-	ND (20)	ND (20)	-	-	-	ND (20)	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20) J
Safrole	-	-	ND (20)	ND (20)	-	-	-	ND (20)	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-	-	ND (20)	ND (20) J
Sulfotep	ND (50)	ND (50)	-	-	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-	ND (50)	-	-
Thionazin	-	-	ND (50)	ND (50)	-	-	-	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-	-	ND (50)	ND (50) J
Volatile Organic Compounds (ug/L)																							
1,1,1,2-Tetrachloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	-	-	-	ND (1)	-	-	-	-
1,1,2,2-Tetrachloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1) J	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	ND (1)	-	-
1,1,2-Trichloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	ND (1)	-	-
1,1-Dichloroethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	-	ND (5)	ND (5)	-	ND (1)	-	-	-
1,1-Dichloroethene	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	ND (1)	-	ND (1)	ND (1)	ND (1)
1,2,3-Trichloropropane	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-	-	ND (1)	ND (1)
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-	ND (2)	-	-
1,2-Dibromoethane (Ethylene Dibromide)	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	-	ND	ND	-	-	-	-	-	ND (1)	ND (1)	ND (1)
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-
1,2-Dichloropropane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	ND (1)	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (20)	-	-
2-Butanone (Methyl Ethyl Ketone)	-	-	ND (10)	ND (10)	-	-	-	ND (10)	ND (10)	**0.79 J**	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	ND (10)	ND (10)
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	ND (50)	-	-	-	-	-
2-Hexanone	-	-	ND (10)	ND (10)	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	-	-	ND (10)	ND (10)	-	-	-	ND (10)	**0.4 J**	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	ND (10)	ND (10)	ND (10)
Acetone	-	-	ND (10)	ND (10)	-	-	-	ND (10)	**1.6 JB**	**5.8 JB**	ND (10)	ND (10)	ND (10)	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10)	ND (10)
Acetonitrile	-	-	ND (20)	ND (20)	-	-	-	ND (20)	ND (20) J	ND (20) J	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)
Acrolein	-	-	ND (20)	ND (20)	-	-	-	ND (20)	ND (20)	ND (20) J	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)
Acrylonitrile	-	-	ND (20)	ND (20)	-	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)
Allyl chloride	ND (2)	ND (2)	-	-	ND (2)	ND (2) J	ND (2)	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-	-	-	-
Benzene	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	ND	ND	ND (17)	ND (5)	ND (5)	-	ND (1)	ND (1)	ND (1)	ND (1)
Bromodichloromethane	-	-	ND (1)	ND (1) J	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	ND (1)	-	ND (1)	ND (1)	ND (1)
Bromoform	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	-	-	-
Bromomethane (Methyl Bromide)	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	-	-	-	-	ND (10)	ND (10)	-	ND (1)	ND (1)	ND (1)	**0.38 JB**
Carbon disulfide	-	-	ND (1)	**0.42 JB**	-	-	-	**0.28 JB**	ND (1)	ND (1)	**1.1**	ND (1)	ND (1)	ND	ND	-	-	-	ND (1)	-	ND (1)	ND (1)	ND (1)
Carbon tetrachloride	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	-	-	-
Chlorobenzene	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	ND (1)	-	ND (1)	ND (1)	ND (1)
Chloroethane	-	-	ND (1)	ND (1)	-	-	-	ND (1) J	ND (1) J	ND (1)	ND (1) J	ND (1)	-	-	-	-	ND (10)	ND (10)	-	ND (1)	ND (1)	ND (1)	ND (1)
Chloroform (Trichloromethane)	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-
Chloromethane (Methyl Chloride)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	ND (1)	-	-	-	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-
Chloroprene	-	-	ND (2)	ND (2)	-	-	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	-	-	-	-	-	ND (2)	ND (2)
cis-1,2-Dichloroethene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	-	ND (5)	ND (5)	-	-	-	-	-
cis-1,3-Dichloropropene	ND (1) J	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	ND (1)	ND (1)
Dibromomethane	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	-	-	ND (1) J	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	-	-	-	-	-	-	-	-	ND (1)	ND (1) J	ND (1) J
Ethyl methacrylate	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	ND (1)	-	-
Ethylbenzene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	ND (8.2)	-	-	-	-	-	-	-
Iodomethane	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-	ND (1)	ND (1)	1 R
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acrylonitrile	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-	ND (2)	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	-	-	ND (2) J	ND (2)	-	-	-	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	-	-	-	-	-	ND (2)	ND (2)
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	ND (1) J	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	ND (5)	ND (5)	-	ND (1)	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (17)	-	-	-	-	-	-	-
Propionitrile (Ethyl cyanide)	ND (4)	ND (4)	-	-	ND (4)	ND (4)	4 R	-	-	-	-	-	4 R	ND	ND	-	-	-	-	-	-	-	-
Styrene	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (5)	ND (5)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J
Tetrachloroethene	ND (1)	ND (1) J	-	-	ND (1) J	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	ND (16)	ND (5)	ND (5)	ND (1)	-	ND (1)	-	-
Toluene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	-	ND (5)	ND (5)	-	ND (1)	-	-	-
trans-1,2-Dichloroethene	-	-	ND (0.5)	ND (0.5)	-	-	-	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	-	-	-	-	-	-	-	-	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropene	-	-	ND (1) J	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	ND (5)	ND (5)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)
trans-1,4-Dichloro-2-butene	ND (1)	ND (1)	-	-	ND (1)	ND (1)	1 R	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-	-	-	-
Trichloroethene	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	ND (1)	-	-	ND (1)	ND (1)
Trichlorofluoromethane (CFC-11)	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	ND (2)	ND (2)	-	-	ND (2)	ND (2)	ND (2)	-	-	-	-	-	ND (2)	-	-	-	ND (10)	ND (10)	-	-	-	-	-
Vinyl chloride	ND (1)	ND (1)	-	-	ND (1)	ND (1)	ND (1)	-	-	-	-	-	ND (1)	ND	ND	-	-	-	ND (1)	-	-	-	-
Xylene (total)	-	-	ND (1)	ND (1)	-	-	-	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (1)	-	ND (1)	ND (1)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	IMW-03-00008S	P-02A	P-02A	P-02B	P-02B	P-02B
	10/12/2005 Primary	7/12/2006 Primary	6/18/2007 Primary	11/27/2007 Primary	9/30/2008 Primary	8/11/2009 Primary	10/12/2010 Primary	9/20/2011 Primary	10/1/2012 Primary	9/23/2013 Primary	8/25/2014 Primary	9/1/2015 Primary	9/20/2016 Primary	10/3/2017 Primary	9/24/2018 Primary	10/30/1990 Primary	3/20/1991 Primary	10/31/1990 Primary	3/20/1991 Primary	7/29/1996 Primary
																		Analytical data for all parameters except arsenic replaced by IMW-03-00004		
Inorganic Compounds (ug/L)																				
Antimony, Total	-	-	-	**3.7 JB**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic, Total	-	-	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**92 [E]**	**22 [E]**	-
Barium, Total	-	-	-	**57.6 J**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium, Total	-	-	**0.47 JB**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium, Total	-	-	-	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium, Total	-	-	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	**21**	-	**38 [C]**	-	-
Cobalt, Total	-	-	-	ND (50)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper, Total	-	-	ND (25)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20 [C]**	-	-
Cyanide	-	-	ND (10)	**14 [C]**	-	-	-	-	-	-	-	-	-	-	-	-	-	**650 [C]**	-	-
Iron, Total	-	-	**5380 [BCG]**	**1960 [BC]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead, Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**45**	ND (5)	-	-	-
Lead, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**63 [F]**	**16**	-
Magnesium, Total	-	-	**34400**	**13500**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese, Total	-	-	**588 [BG]**	**142 [B]**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury, Total	-	-	ND (0.2)	ND (0.2) J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel, Total	-	-	ND (40)	ND (40)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium, Total	-	-	-	ND (5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium, Total	-	-	**666000**	**332000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium, Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin, Total	-	-	ND (100)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium, Total	-	-	-	**1.7 JB**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc, Total	-	-	ND (20)	-	-	-	-	-	-	-	-	-	-	-	-	**70**	-	**180**	-	-
Other (ug/L)																				
Ammonia (as N)	-	-	**300**	**600**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	**1310000**	**350000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness as CaCO3	-	-	-	**250000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab) (pH units)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	**60000**	**43000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfide	-	-	**1800**	ND (1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved Solids (TDS)	-	-	**3100000**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total phenols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**150**	-	-
Total Suspended Solids (TSS)	-	-	ND (4000)	ND (4000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (ug/L)																				
4,4'-DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.05)	-	-
4,4'-DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.05)	-	-
alpha-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.03)	-	-
Aroclor-1016 (PCB-1016)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-
Aroclor-1221 (PCB-1221)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-
Aroclor-1260 (PCB-1260)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.05)	-	-
Endosulfan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.05)	-	-
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.06)	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0)	-	-
gamma-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.04)	-	-
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.03)	-	-
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (0.05)	-	-
Semi-Volatile Organic Compounds (ug/L)																				
1,2,4,5-Tetrachlorobenzene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
1,2-Diphenylhydrazine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trinitrobenzene	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
1,3-Dinitrobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
1,4-Dichlorobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
1,4-Naphthoquinone	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
1-Naphthylamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	-	-	-	-	-	-	-	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2,3,4,6-Tetrachlorophenol	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
2,4-Dinitrophenol	ND (50)	ND (50)	ND (50) J	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50) J	-	-	-	-	-	-	-
2,4-Dinitrotoluene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2,6-Dichlorophenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2,6-Dinitrotoluene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2-Acetylaminofluorene	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	-	-	ND (100)	-	-	ND (100)	-	-	-	-	-	-	-
2-Chloronaphthalene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2-Chlorophenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2-Methylnaphthalene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2-Naphthylamine	ND (10)	ND (10)	ND (10)	10 R	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
2-Nitroaniline	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2-Picoline	-	-	-	-	-	-	-	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-
2-Toluidine	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
3,3-Dimethylbenzidine	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	50 R	50 R	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
3-Methylcholanthrene	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
3-Methylphenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
4-Aminobiphenyl	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
4-Chloroaniline	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
4-Methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
4-Nitroaniline	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	ND (50)	-	-	-	-	-	-	-
4-Nitroquinoline-N-oxide	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Nitro-2-Toluidine	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
7,12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
a,a-Dimethylphenethylamine	-	-	-	-	-	-	-	50 R	ND (50)	-	ND (50) J	ND (50)	-	-	-	-	-	-	-	-
Acenaphthene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Acenaphthylene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Acetophenone	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-
Aniline	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Anthracene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Aramite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzidine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Benzo(a)pyrene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10) J	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Benzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate**	-	-	-	-	-	-	-	ND (10)	**1.7 JB [C]**	-	**4.4 JB [AC]**	**1.7 JB [C]**	ND (10)	-	-	-	-	**12 [ACI]**	-	-
Butyl benzylphthalate	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzilate	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Chrysene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Diallate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Dibenzofuran	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Diethyl phthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Dimethoate	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Dimethyl phthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Di-n-butylphthalate	-	-	-	-	-	-	-	ND (10)	**0.7 J**	-	ND (10)	**1.5 JB**	**0.44 JB**	-	-	-	-	-	-	-
Di-n-octyl phthalate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Dinoseb	ND (20)	ND (20)	ND (20) J	ND (20)	ND (20)	ND (20)	ND (20)	-	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-
Diphenylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Disulfoton	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
Ethyl methanesulfonate	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Famphur	-	-	-	-	-	-	-	10 R	10 R	-	10 R	10 R	-	-	-	-	-	-	-	-
Fluoranthene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Hexachlorobenzene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50 R	50 R	50 R	50 R	ND (50)	ND (50)	ND (50)	-	-	50 R	-	-	ND (50)	-	-	-	-	-	-	-
Hexachloroethane	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Hexachloropropene	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	-	-	ND (100)	-	-	ND (100)	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Isophorone	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Isosafrole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methapyrilene	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
Methyl methanesulfonate	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Nitrobenzene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosodiethylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosodimethylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10) J	-	-	-	-	-	-	-
N-Nitrosodi-N-butylamine	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosomethylethylamine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
N-Nitrosomorpholine	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	-	-	-	-	ND (10)	-	-	-	-	-	-	-
N-Nitrosopyrrolidine	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
o,o,o-Triethylphosphorothioate	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
P-DIMETHYLAMINOAZOBENZENE	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Pentachlorobenzene	-	-	-	-	-	-	-	ND (10)	ND (10)	-	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Pentachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachloronitrobenzene	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
Pentachlorophenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Phenacetin	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Phenanthrene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	ND (10)	-	-
Phenol	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	ND (10)	-	-	-	-	**88**	-	-
Phorate	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
p-Phenylenediamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pronamide	-	-	-	-	-	-	-	ND (20)	ND (20)	-	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Pyrene	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	ND (10)	-	-	ND (10)	-	-	-	-	-	-	-
Pyridine	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-
Safrole	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	ND (20)	-	-	ND (20)	-	-	-	-	-	-	-
Sulfotep	-	-	-	-	-	-	-	ND (50)	ND (50)	-	ND (50)	ND (50)	-	-	-	-	-	-	-	-
Thionazin	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	-	-	ND (50)	-	-	ND (50)	-	-	-	-	-	-	-
Volatile Organic Compounds (ug/L)																				
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-
1,1-Dichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
1,2-Dichloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	-	ND	ND	-	-	-	-	-
1,2-Dichloroethene (total)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
1,4-Dioxane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
2-Chloroethyl vinyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ND (10) J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-	-
Acetone	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	**1.6 JB**	ND (10)	ND (10)	ND (10)	-	-	-	-	-	-	-
Acetonitrile	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20) J	ND (20) J	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Acrolein	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20) J	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Acrylonitrile	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	-	-	-	-	-	-	-	-
Allyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
Benzene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	ND	ND	-	-	**98000 [ABCE]**	-	**4300 [ABCE]**
Bromodichloromethane	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
Bromoform	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	-	-	-	-	-	-	-
Carbon disulfide	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	**0.17 JB**	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND	-	-	-	-	-
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Chlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
Chloroethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1) J	ND (1)	ND (1) J	ND (1)	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Chloroprene	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
Dibromomethane	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1) J	ND (1)	-	-	-	-	-	-	-	-
Ethyl methacrylate	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	ND (5)	-	**9.3**
Iodomethane	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
Isobutyl alcohol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene (Cumene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acrylonitrile	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
Methyl cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl methacrylate	ND (2)	ND (2)	ND (2) J	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	ND (2)	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**230 [C]**	-	**22**
Propionitrile (Ethyl cyanide)	-	-	-	-	-	-	-	-	-	-	-	-	4 R	ND	ND	-	-	-	-	-
Styrene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
Tetrachloroethene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	ND (16)
Toluene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	ND (10)
trans-1,2-Dichloroethene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	ND (1)	ND (1)	ND (1) J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	-
trans-1,4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-
Trichloroethene	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (15)
Trichlorofluoromethane (CFC-11)	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl acetate	-	-	-	-	-	-	-	-	-	-	-	-	ND (2)	-	-	-	-	-	-	-
Vinyl chloride	-	-	-	-	-	-	-	-	-	-	-	-	ND (1)	ND	ND	-	-	-	-	-
Xylene (total)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	-	-	-	-	-	-	-	ND (17)

Notes and abbreviations on last page

TABLE 1
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

Notes and abbreviations

1: Phase II RFI Tier 1A Groundwater Screening Criteria cited in Phase II RFI-ISA Report (AECOM) based on IDEM Ambient Surface Water Criteria (ASWQC), for human exposures to non-drinking water sources (December 2002)
2: Phase II RFI Tier 1A Groundwater Screening Criteria cited in Phase II RFI-ISA Report (AECOM) based on IDEM ASWQC, for chronic exposure of aquatic life to surface water (2002)
3: Phase II RFI Tier 1A Groundwater Screening Criteria cited in Phase II RFI-ISA Report (AECOM) based on IDEM Regulations (327 IAC 2-1.5-8(b)(6)) and are 30-day average criteria
4: Phase II RFI Tier 1A Groundwater Screening Criteria cited in Phase II RFI-ISA Report (AECOM) based on IDEM RISC Default Closure Values for Industrial Exposure Scenarios (2006)
5: Criteria based on Chromium VI
6: Tier 1B Default Risk Criteria cited in Phase II RFI-FPA Report (AECOM) based on, in priority of order, IDEM ambient surface water quality criteria and U.S. EPA National Recommended Water Quality Criteria, and U.S. EPA Ecological Screening Levels multiplied by the FPA Default Dilution factor of 10.
A: Indicates result is greater than Tier1A Groundwater to Surface Water - Human Carcinogen
B: Indicates result is greater than Tier1A Groundwater to Surface Water - Human Non-Carcinogen
C: Indicates result is greater than Tier1A Groundwater to Surface Water - Ecological Receptors
D: Indicates result is greater than Tier1A Groundwater to Surface Water - Wildlife
E: Indicates result is greater than Tier1A Exposure to Groundwater - Industrial Carcinogen
F: Indicates result is greater than Tier1A Exposure to Groundwater - Industrial Non-Carcinogen
G: Facility Parameter Area sample result is greater than Tier 1B Default Screening Criteria
H: Facility Parameter Area sample result is greater than Tier 1B Non-Default Screening Criteria
I: Facility Parameter Area sample result is greater than Tier 1B Default Screening Criteria Ecological
[a] Recent analytical results represented by IMW-02-00004S/D. However, the results reported for this location are evaluated in the HHRA.

IHSC: Indiana Harbor Shipping Canal
J: Estimated value. All results reported are less than the DL, but greater than the MDL.
JB: Suspected lab contaminant, not expected to be present in sample.
R: Data rejected in accordance with established data validation acceptance criteria.
** Common lab contaminant

APPENDIX B

Analytical Soil Data Used in Risk Assessment

APPENDIX - B
SUMMARY OF SOIL ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

Location	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-01	SB-01	SB-02	SB-02	SB-03	SB-03	SB-04	SB-04	SB-04	SB-05	SB-05	SB-05	SB-06	SB-06	SB-07	SB-07	SB-08	SB-08
Sample Date			03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/05/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/06/2019	03/07/2019	03/07/2019
Sample Type			N	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N
Sample Depth (bgs)			0 - 2 (ft)	5 - 7 (ft)	0 - 2 (ft)	6 - 8 (ft)	0 - 2 (ft)	6 - 8 (ft)	0 - 2 (ft)	0 - 2 (ft)	6 - 8 (ft)	0 - 2 (ft)	6 - 8 (ft)	6 - 8 (ft)	0 - 2 (ft)	2 - 4 (ft)	0 - 2 (ft)	4 - 6 (ft)	0 - 2 (ft)	2 - 4 (ft)
Inorganic Compounds (mg/kg)																				
Antimony	470	790	**0.71 J**	ND (1)	ND (0.92)	ND (1.1)	ND (0.9)	ND (1.1)	**2.6**	ND (17)	ND (0.84)	ND (1.1) F2F1	**0.59 J**	**0.46 J**	**1.5 J**	ND (0.86)	ND (2)	ND (1.1)	**2.2 J**	**0.79 J**
Arsenic	30	920	**3.8 J**	**4.3**	ND (4.6)	**2.1**	ND (4.5)	**2.2**	ND (15)	ND (17)	**3.2**	**3.7 J**	**3.4**	**3.5**	ND (22)	**1.4**	**5.6**	**1.9**	ND (17)	**5.9 J**
Barium	100000	100000	**100**	**17 J**	**280**	**3.3 J**	**300**	**5.2 J**	**150**	**180**	**9.4 J**	**140 F1**	**11 J**	**11 J**	**170**	**2.6 J**	**210**	**3.4 J**	**110**	**31**
Beryllium	2300	3800	**0.41 J**	ND (0.51)	**6.2**	ND (0.55)	**6.6**	ND (0.54)	**0.55**	**0.4 J**	**0.072 J**	**2.4 F1**	**0.097 J**	**0.081 J**	**2.5**	**0.047 J**	**4**	ND (0.56)	**0.88**	**0.34 J**
Cadmium	980	1900	**0.24**	**0.089 J**	**0.072 J**	ND (0.22)	**0.11 J**	**0.11 J**	**0.72**	ND (3.3)	**0.081 J**	**0.59**	**0.26**	**0.27**	**0.56**	**0.059 J**	**1.5**	**0.057 J**	**1.5**	**0.5**
Chromium	-	-	**210**	**7.8**	**22**	**6**	**100**	**4.7**	**800**	**1100**	**23 F1**	**120**	**7.4**	**8**	**920**	**4.1**	**120**	**4.1**	**640**	**320**
Cobalt	350	590	**2.2**	**1.8**	**0.67 J**	**1.4**	**0.88 J**	**1.9**	**2.3**	**1.9**	**3.5**	**1.2**	**1.4**	**1.5**	**1.2**	**1.4**	**3.7**	**1.1**	**6.1**	**3**
Copper	47000	79000	**16**	**6.1**	**6.5 J**	**1.8 J**	**24**	**3.7**	**62**	**45**	**9**	**20**	**7.3**	**6.6**	**31**	**1.3 J**	**100**	**2 J**	**140**	**58**
Cyanide	150	560	**0.43 J**	ND (0.56)	**2.3**	ND (0.58)	**1.9**	ND (0.53)	**1.6**	**1.2**	ND (0.59)	**0.6**	ND (0.5)	ND (0.55)	**0.55 J**	ND (0.6)	**1.2**	ND (0.6)	**0.57**	**0.22 J**
Iron	100000	100000	**44000**	**5400**	**6100**	**4100**	**11000**	**4600**	**66000**	**210000** [AB]	**9300 F2**	**26000**	**7000**	**7200**	**88000**	**3500**	**67000**	**4200**	**110000** [AB]	**50000**
Lead	800	1000	**29**	**8.4**	**6**	**2.1**	**9.8**	**4**	**94**	**33**	**7.1**	**37 F1**	**16**	**17**	**40**	**2.5**	**110**	**2.3**	**170**	**32**
Magnesium	-	-	**22000**	**15000**	**37000**	**12000**	**36000**	**19000**	**28000**	**26000**	**11000 F1F2**	**26000 F2**	**8200**	**9200**	**30000**	**16000**	**25000**	**9800**	**21000**	**7000**
Manganese	26000	46000	**4100 B**	**160 B**	**3300 B**	**160 B**	**3700 B**	**180 B**	**15000 B**	**16000 B**	**360 B**	**4200**	**220 B**	**300 B**	**5100 B**	**140 B**	**4200 B**	**120 B**	**11000 B**	**6100**
Mercury	3.1	3.1	ND (0.12)	ND (0.12)	ND (0.11)	ND (0.13)	ND (0.11)	ND (0.12)	**0.08 J**	**0.17**	ND (0.12)	**0.049 J**	ND (0.11)	ND (0.13)	**0.061 J**	ND (0.13)	**0.13**	ND (0.13)	**0.08 J**	**0.038 J**
Nickel	22000	38000	**9.3**	**3.7 J**	**3.6 J**	**2.6 J**	**10**	**3.7 J**	**22**	**14 J**	**6.2**	**9**	**4 J**	**3.9 J**	**12**	**2.3 J**	**44**	**2.6 J**	**72**	**34**
Selenium	5800	9800	ND (7.9)	ND (1.5)	**3.7 J**	ND (1.6)	ND (6.7)	ND (1.6)	ND (23)	ND (25)	**0.78 J**	ND (8)	**0.5 J**	ND (1.5)	ND (32)	ND (1.3)	**4.6 J**	ND (1.7)	ND (26)	ND (13)
Silver	5800	9800	**0.91 B**	**0.26 JB**	**0.81 B**	**0.13 JB**	**0.76 B**	**0.21 JB**	**2.9 B**	**2.6 B**	**0.2 JB**	ND (0.53)	**0.26 JB**	**0.23 JB**	**2.9 B**	**0.2 JB**	**1.1 B**	**0.35 JB**	**2.2 B**	ND (0.44)
Sodium	-	-	**220 J**	**100 J**	**1300**	**100 J**	**1300**	**100 J**	**170 J**	**190 J**	**77 J**	**810**	**89 J**	**99 J**	**430 J**	**92 J**	**550**	**82 J**	**260 J**	**73 J**
Thallium	12	20	ND (5.3)	ND (1)	ND (4.6)	ND (1.1)	ND (4.5)	ND (1.1)	ND (15)	ND (17)	ND (0.84)	**6.7**	ND (1)	ND (0.99)	ND (22)	ND (0.86)	ND (4.9)	ND (1.1)	ND (17)	**4.8 J**
Tin	100000	100000	**5 J**	ND (10)	ND (9.2)	ND (11)	**4.4 J**	ND (11)	**7.6**	**6 J**	**3 J**	**5.2 J**	**3.8 J**	**3.7 J**	**15**	ND (8.6)	**11**	ND (11)	**15**	**10**
Vanadium	5800	9900	**110**	**9**	**17**	**11**	**25**	**8.7**	**230**	**540**	**13**	**46 F2F1**	**9.2**	**8.7**	**240**	**8.6**	**48**	**9.5**	**200**	**42**
Zinc	100000	100000	**88**	**26**	**23**	**12**	**140**	**19**	**260**	**90**	**24**	**150 F1**	**40**	**42**	**120**	**12**	**340**	**11**	**330**	**100**
Other (mg/kg)																				
Sulfide	-	-	**63**	**49**	**1500**	**34 J**	**1500**	ND (35)	**94**	**82**	**83**	**430**	ND (32)	**19 J**	**180**	ND (36)	**230**	**21 J**	**90**	**19 J**
Semi-Volatile Organic Compounds (ug/kg)																				
2,2'-oxybis(1-Chloropropane)	1000000	1000000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	ND (280)	ND (110)
2,4,5-Trichlorophenol	82000000	100000000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800) F1	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
2,4,6-Trichlorophenol	820000	1800000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800) F1	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
2,4-Dichlorophenol	2500000	5200000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800)	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
2,4-Dimethylphenol	16000000	34000000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800)	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
2,4-Dinitrophenol	1600000	3400000	ND (1800)	ND (360)	ND (350)	ND (380)	ND (370)	ND (380)	ND (360)	ND (1800) F1	ND (360)	ND (700) F1	ND (350)	ND (360)	ND (1400)	ND (390)	ND (710)	ND (390)	ND (930)	ND (360)
2,4-Dinitrotoluene	74000	3400000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
2,6-Dinitrotoluene	15000	520000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
2-Chloronaphthalene	60000000	100000000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
2-Chlorophenol	5800000	9800000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
2-Methylnaphthalene	3000000	6800000	**52 J**	**24**	**28**	ND (17)	**8.5 J**	ND (17)	**100**	**110**	**22**	**150**	**10 J**	**31**	**64 J**	ND (18)	**44**	ND (18)	**64**	**46**
2-Methylphenol (o-Cresol)	41000000	87000000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
2-Nitroaniline	8000000	18000000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
2-Nitrophenol	-	-	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
3&4-Methylphenol	-	-	ND (2200)	ND (440)	ND (430)	ND (460)	ND (440)	ND (460)	ND (430)	ND (2100)	ND (430)	ND (850)	ND (430)	ND (440)	ND (1700)	ND (470)	ND (860)	ND (480)	ND (1100)	ND (440)
3,3'-Dichlorobenzidine	51000	2700000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	ND (280)	ND (110)
3-Nitroaniline	-	-	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
4,6-Dinitro-2-methylphenol	66000	140000	ND (1800)	ND (360)	ND (350)	ND (380)	ND (370)	ND (380)	ND (360)	ND (1800)	ND (360)	ND (700)	ND (350)	ND (360)	ND (1400)	ND (390)	ND (710)	ND (390)	ND (930)	ND (360)
4-Bromophenyl phenyl ether	-	-	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
4-Chloro-3-methylphenol	82000000	100000000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800)	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
4-Chloroaniline	110000	6000000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800)	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
4-Chlorophenyl phenyl ether	-	-	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
4-Nitroaniline	1100000	7000000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
4-Nitrophenol	-	-	ND (1800)	ND (360)	ND (350)	ND (380)	ND (370)	ND (380)	ND (360)	ND (1800) F1	ND (360)	ND (700)	ND (350)	ND (360)	ND (1400)	ND (390)	ND (710)	ND (390)	ND (930)	ND (360)
Acenaphthene	45000000	100000000	**64 J**	ND (16)	ND (16)	ND (17)	**28**	ND (17)	**20**	**28 J**	**31**	**87**	ND (16)	ND (16)	**95**	ND (18)	**50**	ND (18)	**13 J**	**83**
Acenaphthylene	-	-	ND (81)	ND (16)	**4.5 J**	ND (17)	**8.7 J**	ND (17)	**14 J**	ND (80)	ND (16)	**39**	ND (16)	ND (16)	**97**	ND (18)	**220**	ND (18)	**17 J**	ND (16)
Acetophenone	2500000	2500000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	**22 J**	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	**54 J**	**16 J**

Location Sample Date Sample Type Sample Depth (bgs)	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-01 03/05/2019 N 0 - 2 (ft)	SB-01 03/05/2019 N 5 - 7 (ft)	SB-02 03/05/2019 N 0 - 2 (ft)	SB-02 03/05/2019 N 6 - 8 (ft)	SB-03 03/05/2019 N 0 - 2 (ft)	SB-03 03/05/2019 N 6 - 8 (ft)	SB-04 03/05/2019 N 0 - 2 (ft)	SB-04 03/05/2019 FD 0 - 2 (ft)	SB-04 03/05/2019 N 6 - 8 (ft)	SB-05 03/06/2019 N 0 - 2 (ft)	SB-05 03/06/2019 N 6 - 8 (ft)	SB-05 03/06/2019 FD 6 - 8 (ft)	SB-06 03/06/2019 N 0 - 2 (ft)	SB-06 03/06/2019 N 2 - 4 (ft)	SB-07 03/06/2019 N 0 - 2 (ft)	SB-07 03/06/2019 N 4 - 6 (ft)	SB-08 03/07/2019 N 0 - 2 (ft)	SB-08 03/07/2019 N 2 - 4 (ft)
Anthracene	100000000	100000000	**130**	**49**	**14 J**	ND (17)	**180**	ND (17)	**65**	**86**	**74**	**230**	**4.8 J**	**8.5 J**	**360**	ND (18)	**270**	**4.6 J**	**49**	**210**
Atrazine	100000	5200000	ND (1100)	ND (220)	ND (220)	ND (230)	ND (220)	ND (230)	ND (220)	ND (1100)	ND (220)	ND (420)	ND (210)	ND (220)	ND (870)	ND (240)	ND (430)	ND (240)	ND (570)	ND (220)
Benzaldehyde	1200000	1200000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	**69 J**	ND (110)
Benzo(a)anthracene	210000	12000000	**220**	ND (16)	**62**	**14 J**	**280**	ND (17)	**250**	**280**	**200**	**740**	**29**	**50**	**1100**	**13 J**	**830**	**16 J**	**160**	**440**
Benzo(a)pyrene	21000	500000	**250**	**97**	**58**	**20**	**190**	ND (17)	**210**	**220**	**190**	**710**	**37**	**58**	**700**	**15 J**	**1400**	**19**	**200**	**470**
Benzo(b)fluoranthene	210000	12000000	**250**	**58**	**120**	**22**	**380**	ND (17)	**410**	**430**	**230**	**1100**	**60**	**100**	**1500**	**15 J**	**1900**	**29**	**340**	**690**
Benzo(g,h,i)perylene	-	-	**360**	**450**	**67**	**14 J**	**97**	ND (17)	**200**	**240**	**150**	**640**	**37**	**67**	**600**	**12 J**	**1400**	**17 J**	**170**	**400**
Benzo(k)fluoranthene	2100000	100000000	ND (81)	ND (16)	**29**	ND (17)	**150**	ND (17)	**130**	**130**	**120**	**380**	**20**	**26**	**390**	ND (18)	**680**	**9.9 J**	**89**	**260**
Biphenyl	200000	1100000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	**27 J**	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
bis(2-Chloroethoxy)methane	2500000	5200000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	ND (280)	ND (110)
bis(2-Chloroethyl)ether	10000	810000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	ND (280)	ND (110)
bis(2-Ethylhexyl)phthalate	1600000	34000000	ND (380)	ND (76)	**56 J**	ND (80)	**140**	ND (81)	**400**	ND (370) F1	**100 F1**	ND (150)	ND (75)	ND (77)	**330**	ND (83)	**170**	ND (83)	ND (200)	ND (76)
Butyl benzylphthalate	12000000	100000000	ND (380)	ND (76)	ND (75)	ND (80)	ND (78)	ND (81)	ND (76)	ND (370)	ND (75)	ND (150)	ND (75)	ND (77)	ND (300)	ND (83)	ND (150)	ND (83)	ND (200)	ND (76)
Caprolactam	100000000	100000000	ND (1800)	ND (360)	ND (350)	ND (380)	ND (370)	ND (380)	ND (360)	ND (1800)	ND (360)	ND (700)	ND (350)	ND (360)	ND (1400)	ND (390)	ND (710)	ND (390)	ND (930)	ND (360)
Carbazole	-	-	ND (270)	ND (54)	ND (54)	ND (57)	**92**	ND (58)	**35 J**	ND (270)	**39 J**	**120**	ND (53)	ND (55)	ND (220)	ND (59)	**110**	ND (59)	ND (140)	**95**
Chrysene	21000000	100000000	**280**	ND (16)	**88**	**17**	**330**	ND (17)	**330**	**380**	**220**	**790**	**43**	**61**	**1400**	**13 J**	**1100**	**24**	**220**	**550**
Dibenz(a,h)anthracene	21000	1200000	ND (81)	ND (16)	ND (16)	ND (17)	**33**	ND (17)	**65**	ND (80)	**36**	**120**	**13 J**	**23**	**180**	ND (18)	**370**	ND (18)	**44**	**110**
Dibenzofuran	1000000	1900000	ND (270)	ND (54)	ND (54)	ND (57)	**36 J**	ND (58)	**59**	**82 J**	**20 J**	**97 J**	ND (53)	ND (55)	**65 J**	ND (59)	**63 J**	ND (59)	**39 J**	**59**
Diethyl phthalate	100000000	100000000	ND (380)	ND (76)	ND (75)	ND (80)	ND (78)	ND (81)	ND (76)	ND (370)	ND (75)	ND (150)	ND (75)	ND (77)	ND (300)	ND (83)	ND (150)	ND (83)	ND (200)	ND (76)
Dimethyl phthalate	-	-	ND (380)	ND (76)	ND (75)	ND (80)	ND (78)	ND (81)	ND (76)	ND (370)	ND (75)	ND (150)	ND (75)	ND (77)	ND (300)	ND (83)	ND (150)	ND (83)	**70 J**	ND (76)
Di-n-butylphthalate	82000000	100000000	ND (380)	ND (76)	ND (75)	ND (80)	ND (78)	ND (81)	ND (76)	ND (370)	ND (75)	ND (150)	ND (75)	ND (77)	ND (300)	ND (83)	ND (150)	ND (83)	ND (200)	ND (76)
Di-n-octyl phthalate	8200000	18000000	ND (380)	ND (76)	ND (75)	ND (80)	ND (78)	ND (81)	ND (76)	ND (370)	ND (75)	ND (150)	ND (75)	ND (77)	ND (300)	ND (83)	ND (150)	ND (83)	ND (200)	ND (76)
Fluoranthene	30000000	68000000	**570**	**20**	**130**	**37**	**850**	**6.9 J**	**590**	**730**	**470**	**1600**	**42**	**77**	**4300**	**23**	**1100**	**32**	**370**	**990**
Fluorene	30000000	68000000	**55 J**	ND (16)	ND (16)	ND (17)	**16 J**	ND (17)	**15 J**	**32 J**	**28**	**76**	ND (16)	**4.9 J**	**76**	ND (18)	**46**	ND (18)	ND (42)	**78**
Hexachlorobenzene	9600	630000	ND (81)	ND (16)	ND (16)	ND (17)	ND (17)	ND (17)	ND (16)	ND (80)	ND (16)	ND (32)	ND (16)	ND (16)	ND (65)	ND (18)	ND (32)	ND (18)	ND (42)	ND (16)
Hexachlorobutadiene	17000	17000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
Hexachlorocyclopentadiene	7500	16000	ND (1800)	ND (360)	ND (350)	ND (380)	ND (370)	ND (380)	ND (360)	ND (1800) F1	ND (360) F1	ND (700) F1	ND (350)	ND (360)	ND (1400)	ND (390)	ND (710)	ND (390)	ND (930)	ND (360)
Hexachloroethane	80000	1100000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
Indeno(1,2,3-cd)pyrene	210000	12000000	**150**	ND (16)	**44**	ND (17)	**93**	ND (17)	**150**	**180**	**120**	**480**	**28**	**51**	**510**	**13 J**	**1200**	**13 J**	**140**	**330**
Isophorone	24000000	100000000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
Naphthalene	170000	3100000	**86**	**11 J**	**24**	ND (17)	**13 J**	ND (17)	**100**	**150**	**22**	**200**	**10 J**	**23**	**82**	ND (18)	**77**	ND (18)	**82**	**100**
Nitrobenzene	220000	3100000	ND (540)	ND (110)	ND (110)	ND (110)	ND (110)	ND (120)	ND (110)	ND (530)	ND (110)	ND (210)	ND (110)	ND (110)	ND (430)	ND (120)	ND (210)	ND (120)	ND (280)	ND (110)
N-Nitrosodi-n-propylamine	3300	180000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
N-Nitrosodiphenylamine	4700000	100000000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	ND (140)	ND (55)
Pentachlorophenol	40000	2600000	ND (810)	ND (160)	ND (160)	ND (170)	ND (170)	ND (170)	ND (160)	ND (800) F1	ND (160)	ND (320)	ND (160)	ND (160)	ND (650)	ND (180)	ND (320)	ND (180)	ND (420)	ND (160)
Phenanthrene	-	-	**510**	**28**	**71**	ND (17)	**670**	ND (17)	**330**	**460**	**300**	**1000**	**28**	**65**	**940**	**15 J**	**520**	**20**	**280**	**720**
Phenol	100000000	100000000	ND (270)	ND (54)	ND (54)	ND (57)	ND (56)	ND (58)	ND (54)	ND (270)	ND (54)	ND (110)	ND (53)	ND (55)	ND (220)	ND (59)	ND (110)	ND (59)	**23 J**	ND (55)
Pyrene	23000000	51000000	**530**	**51**	**150**	**28**	**620**	**7.1 J**	**530**	**660**	**380**	**1300**	**43**	**73**	**3400**	**22**	**1100**	**30**	**310**	**810**
Volatile Organic Compounds (ug/kg)																				
1,1,1-Trichloroethane	640000	640000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260) *	ND (260)	ND (250)	**65 J***	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
1,1,2,2-Tetrachloroethane	27000	1900000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250) F2	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,1,2-Trichloroethane	6300	35000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,1-Dichloroethane	160000	1700000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,1-Dichloroethene	1000000	1200000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,2,4-Trichlorobenzene	260000	400000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,2-Dibromo-3-chloropropane (DBCP)	640	86000	ND (560) *	ND (550) *	ND (540) *	ND (600) *	ND (570) *	ND (590) *	ND (520) *	ND (510) *	ND (490) *F2	ND (520) *	ND (560) *	ND (540) *	ND (520) *	ND (660) *	ND (600) *	ND (660) *	ND (670) *	ND (560) *
1,2-Dibromoethane (Ethylene Dibromide)	1600	180000	ND (280) *	ND (270) *	ND (270) *	ND (300) *	ND (290) *	ND (290) *	ND (260) *	ND (260) *	ND (250) *	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
1,2-Dichlorobenzene	380000	380000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,2-Dichloroethane	20000	730000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250) F1	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,2-Dichloropropane	66000	360000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,3-Dichlorobenzene	-	-	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
1,4-Dichlorobenzene	110000	16000000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
2-Butanone (Methyl Ethyl Ketone)	28000000	28000000	ND (1100)	ND (1100)	ND (1100)	ND (1200)	ND (1100)	ND (1200)	ND (1000)	ND (1000)	ND (990)	ND (1000)	ND (1100)	ND (1100)	ND (1000)	ND (1300)	ND (1200)	ND (1300)	ND (1300)	ND (1100)
2-Hexanone	1300000	3300000	ND (1100)	ND (1100)	ND (1100)	ND (1200)	ND (1100)	ND (1200)	ND (1000)	ND (1000)	ND (990)	ND (1000)	ND (1100)	ND (1100)	ND (1000)	ND (1300)	ND (1200)	ND (1300)	ND (1300)	ND (1100)

Location Sample Date Sample Type Sample Depth (bgs)	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-01 03/05/2019 N 0 - 2 (ft)	SB-01 03/05/2019 N 5 - 7 (ft)	SB-02 03/05/2019 N 0 - 2 (ft)	SB-02 03/05/2019 N 6 - 8 (ft)	SB-03 03/05/2019 N 0 - 2 (ft)	SB-03 03/05/2019 N 6 - 8 (ft)	SB-04 03/05/2019 N 0 - 2 (ft)	SB-04 03/05/2019 FD 0 - 2 (ft)	SB-04 03/05/2019 N 6 - 8 (ft)	SB-05 03/06/2019 N 0 - 2 (ft)	SB-05 03/06/2019 N 6 - 8 (ft)	SB-05 03/06/2019 FD 6 - 8 (ft)	SB-06 03/06/2019 N 0 - 2 (ft)	SB-06 03/06/2019 N 2 - 4 (ft)	SB-07 03/06/2019 N 0 - 2 (ft)	SB-07 03/06/2019 N 4 - 6 (ft)	SB-08 03/07/2019 N 0 - 2 (ft)	SB-08 03/07/2019 N 2 - 4 (ft)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	3400000	3400000	ND (1100)	ND (1100)	ND (1100)	ND (1200)	ND (1100)	ND (1200)	ND (1000)	ND (1000)	ND (990)	ND (1000)	ND (1100)	ND (1100)	ND (1000)	ND (1300)	ND (1200)	ND (1300)	ND (1300)	ND (1100)
Acetone	100000000	100000000	ND (1100)	ND (1100)	ND (1100)	ND (1200)	ND (1100)	ND (1200)	ND (1000)	ND (1000)	ND (990)	ND (1000)	ND (1100)	ND (1100)	ND (1000)	ND (1300)	ND (1200)	ND (1300)	ND (1300)	ND (1100)
Benzene	51000	1800000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	**8.4 J**	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	**15 J**	ND (280)
Bromodichloromethane	13000	930000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Bromoform	860000	920000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260) *	ND (260)	ND (250)	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
Bromomethane (Methyl Bromide)	30000	160000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Carbon disulfide	740000	740000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250) F2	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Carbon tetrachloride	29000	460000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260) *	ND (260)	ND (250)	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
Chlorobenzene	760000	760000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Chloroethane	2100000	2100000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260) F2	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Chloroform (Trichloromethane)	14000	1900000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Chloromethane (Methyl Chloride)	460000	1300000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
cis-1,2-Dichloroethene	2300000	2400000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
cis-1,3-Dichloropropene	-	-	ND (280) *	ND (270) *	ND (270) *	ND (300) *	ND (290) *	ND (290) *	ND (260) *	ND (260) *	ND (250) *	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
Cyclohexane	120000	120000	ND (560)	ND (550)	ND (540)	ND (600)	ND (570)	ND (590)	ND (520)	ND (510)	ND (490)	ND (520)	ND (560)	ND (540)	ND (520)	ND (660)	ND (600)	ND (660)	ND (670)	ND (560)
Dibromochloromethane	390000	800000	ND (280) *	ND (270) *	ND (270) *	ND (300) *	ND (290) *	ND (290) *	ND (260) *	ND (260) *	ND (250) *	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
Dichlorodifluoromethane (CFC-12)	370000	850000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Ethylbenzene	250000	480000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	**26 J**	**18 J**	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	**19 J**	ND (280)
Isopropylbenzene (Cumene)	270000	270000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Methyl acetate	29000000	29000000	ND (1400)	ND (1400)	ND (1300)	ND (1500)	ND (1400)	ND (1500)	ND (1300)	ND (1300)	ND (1200) F1	ND (1300)	ND (1400)	ND (1400)	**2100**	ND (1700)	ND (1500)	ND (1600)	**900 J**	ND (1400)
Methyl cyclohexane	-	-	ND (560)	ND (550)	ND (540)	ND (600)	ND (570)	ND (590)	ND (520)	ND (510)	**120 J**	**80 J**	ND (560)	ND (540)	ND (520)	ND (660)	ND (600)	ND (660)	ND (670)	ND (560)
Methyl Tert Butyl Ether	2100000	8900000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Methylene chloride	3200000	3300000	ND (560)	ND (550)	ND (540)	ND (600)	ND (570)	ND (590)	ND (520)	ND (510)	ND (490)	ND (520)	ND (560)	ND (540)	ND (520)	ND (660)	ND (600)	ND (660)	ND (670)	ND (560)
Naphthalene	170000	3.10E+06	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	**170 J***	ND (260)	ND (250)	**190 J***	ND (280)*	ND (270)*	ND (260)*	ND (330)*	ND (300)*	ND (330)*	ND (340)*	ND (280)*
Styrene	870000	870000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Tetrachloroethene	170000	170000	**77 J**	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	**33 J**	**29 J**	ND (250)	**190 J**	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	**51 J**	ND (280)
Toluene	820000	820000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	**110 J**	**83 J**	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
trans-1,2-Dichloroethene	1900000	1900000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
trans-1,3-Dichloropropene	-	-	ND (280) *	ND (270) *	ND (270) *	ND (300) *	ND (290) *	ND (290) *	ND (260) *	ND (260) *	ND (250) *	ND (260) *	ND (280) *	ND (270) *	ND (260) *	ND (330) *	ND (300) *	ND (330) *	ND (340) *	ND (280) *
Trichloroethene	19000	95000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250) F1	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Trichlorofluoromethane (CFC-11)	1200000	1200000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Trifluorotrichloroethane (Freon 113)	910000	910000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Vinyl chloride	17000	1300000	ND (280)	ND (270)	ND (270)	ND (300)	ND (290)	ND (290)	ND (260)	ND (260)	ND (250)	ND (260)	ND (280)	ND (270)	ND (260)	ND (330)	ND (300)	ND (330)	ND (340)	ND (280)
Xylene (total)	260000	260000	ND (560)	ND (550)	ND (540)	ND (600)	ND (570)	ND (590)	**26 J**	ND (510)	**180 J**	**85 J**	ND (560)	ND (540)	ND (520)	ND (660)	ND (600)	ND (660)	ND (670)	ND (560)

Notes:
1. Results in **bold** were detected.
2. Results in red exceed one or more of the following IDEM criteria (3/2019)
   [A] - Commercial/Industrial Direct Contact
   [B] - Excavation Direct Contact
3. ND - Not detected above reporting limit
   J - Estimated result
   F1 - MS and/or MSD Recovery outside of acceptance limits
   F2 - MS/MSD exceeds control limits
   F4 - MS/MSD RPD exceeds control limits due to sample size difference
   * - LCS or LCSD is outside of acceptance limits

APPENDIX - B
SUMMARY OF SOIL ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

Location Sample Date Sample Type Sample Depth (bgs)	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-09 03/06/2019 N 0 - 2 (ft)	SB-09 03/06/2019 N 3 - 5 (ft)	SB-10 03/06/2019 N 0 - 2 (ft)	SB-10 03/06/2019 N 4 - 6 (ft)
Inorganic Compounds (mg/kg)						
Antimony	470	790	**0.39 J**	ND (0.94)	ND (1)	ND (0.97)
Arsenic	30	920	**0.7 J**	**3.7**	**4.9**	**1.7**
Barium	100000	100000	**190**	**11 J**	**32**	**4.9 J**
Beryllium	2300	3800	**4.4**	**0.2 J**	**0.28 J**	ND (0.49)
Cadmium	980	1900	**0.61**	**0.22**	**0.36**	**0.078 J**
Chromium	-	-	**62**	**12**	**61**	**44**
Cobalt	350	590	**3.5**	**2.5**	**2.5**	**1.6**
Copper	47000	79000	**70**	**19**	**28**	**3.8**
Cyanide	150	560	**0.67**	ND (0.56)	**0.48 J**	ND (0.59)
Iron	100000	100000	**43000**	**24000**	**19000**	**7100**
Lead	800	1000	**56**	**17**	**29**	**4**
Magnesium	-	-	**23000**	**590**	**16000**	**14000**
Manganese	26000	46000	**540 B**	**600 B**	**1900 B**	**550 B**
Mercury	3.1	3.1	**0.12**	ND (0.12)	**0.019 J**	ND (0.12)
Nickel	22000	38000	**29**	**8.9**	**9.2**	**2.8 J**
Selenium	5800	9800	ND (1.6)	**0.68 J**	**1.4 J**	**0.63 J**
Silver	5800	9800	**0.84 B**	**0.27 JB**	**0.46 JB**	**0.19 JB**
Sodium	-	-	**760**	ND (470)	**150 J**	**77 J**
Thallium	12	20	ND (1)	ND (0.94)	ND (2.1)	ND (0.97)
Tin	100000	100000	**9.6 J**	**4.8 J**	**5 J**	ND (9.7)
Vanadium	5800	9900	**23**	**7.8**	**28**	**14**
Zinc	100000	100000	**170**	**63**	**88**	**17**
Other (mg/kg)						
Sulfide	-	-	**330**	ND (35)	**41**	ND (36)
Semi-Volatile Organic Compounds (ug/kg)						
2,2'-oxybis(1-Chloropropane)	1000000	1000000	ND (210)	ND (120)	ND (270)	ND (120)
2,4,5-Trichlorophenol	82000000	100000000	ND (320)	ND (170)	ND (400)	ND (180)
2,4,6-Trichlorophenol	820000	1800000	ND (320)	ND (170)	ND (400)	ND (180)
2,4-Dichlorophenol	2500000	5200000	ND (320)	ND (170)	ND (400)	ND (180)
2,4-Dimethylphenol	16000000	34000000	ND (320)	ND (170)	ND (400)	ND (180)
2,4-Dinitrophenol	1600000	3400000	ND (700)	ND (380)	ND (890)	ND (390)
2,4-Dinitrotoluene	74000	3400000	ND (420)	ND (230)	ND (540)	ND (230)
2,6-Dinitrotoluene	15000	520000	ND (420)	ND (230)	ND (540)	ND (230)
2-Chloronaphthalene	60000000	100000000	ND (110)	ND (58)	ND (130)	ND (59)
2-Chlorophenol	5800000	9800000	ND (110)	ND (58)	ND (130)	ND (59)
2-Methylnaphthalene	3000000	6800000	**79**	**53**	**130**	**25**
2-Methylphenol (o-Cresol)	41000000	87000000	ND (420)	ND (230)	ND (540)	ND (230)
2-Nitroaniline	8000000	18000000	ND (420)	ND (230)	ND (540)	ND (230)
2-Nitrophenol	-	-	ND (110)	ND (58)	ND (130)	ND (59)
3&4-Methylphenol	-	-	ND (850)	ND (460)	ND (1100)	ND (470)
3,3'-Dichlorobenzidine	51000	2700000	ND (210)	ND (120)	ND (270)	ND (120)
3-Nitroaniline	-	-	ND (420)	ND (230)	ND (540)	ND (230)
4,6-Dinitro-2-methylphenol	66000	140000	ND (700)	ND (380)	ND (890)	ND (390)
4-Bromophenyl phenyl ether	-	-	ND (110)	ND (58)	ND (130)	ND (59)
4-Chloro-3-methylphenol	82000000	100000000	ND (320)	ND (170)	ND (400)	ND (180)
4-Chloroaniline	110000	6000000	ND (320)	ND (170)	ND (400)	ND (180)
4-Chlorophenyl phenyl ether	-	-	ND (110)	ND (58)	ND (130)	ND (59)
4-Nitroaniline	1100000	7000000	ND (420)	ND (230)	ND (540)	ND (230)
4-Nitrophenol	-	-	ND (700)	ND (380)	ND (890)	ND (390)
Acenaphthene	45000000	100000000	**53**	ND (17)	**59**	**17 J**
Acenaphthylene	-	-	**200**	**50**	**29 J**	ND (18)
Acetophenone	2500000	2500000	ND (210)	ND (120)	ND (270)	ND (120)

APPENDIX - B
SUMMARY OF SOIL ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

Location Sample Date Sample Type Sample Depth (bgs)	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-09 03/06/2019 N 0 - 2 (ft)	SB-09 03/06/2019 N 3 - 5 (ft)	SB-10 03/06/2019 N 0 - 2 (ft)	SB-10 03/06/2019 N 4 - 6 (ft)
Anthracene	100000000	100000000	**290**	**66**	**150**	**54**
Atrazine	100000	5200000	ND (420)	ND (230)	ND (540)	ND (230)
Benzaldehyde	1200000	1200000	ND (210)	ND (120)	**63 J**	ND (120)
Benzo(a)anthracene	210000	12000000	**770**	**440**	**370**	**120**
Benzo(a)pyrene	21000	500000	**820**	**680**	**340**	**120**
Benzo(b)fluoranthene	210000	12000000	**1400**	**1200**	**490**	**230**
Benzo(g,h,i)perylene	-	-	**820**	**900**	**240**	**130**
Benzo(k)fluoranthene	2100000	100000000	**450**	**400**	**130**	**62**
Biphenyl	200000	1100000	ND (110)	ND (58)	ND (130)	ND (59)
bis(2-Chloroethoxy)methane	2500000	5200000	ND (210)	ND (120)	ND (270)	ND (120)
bis(2-Chloroethyl)ether	10000	810000	ND (210)	ND (120)	ND (270)	ND (120)
bis(2-Ethylhexyl)phthalate	1600000	34000000	**170**	ND (81)	ND (190)	ND (82)
Butyl benzylphthalate	12000000	100000000	ND (150)	ND (81)	ND (190)	ND (82)
Caprolactam	100000000	100000000	ND (700)	ND (380)	ND (890)	ND (390)
Carbazole	-	-	**92 J**	**27 J**	**69 J**	**25 J**
Chrysene	21000000	100000000	**880**	**680**	**420**	**140**
Dibenz(a,h)anthracene	21000	1200000	**220**	**280**	**63**	**39**
Dibenzofuran	1000000	1900000	**71 J**	**33 J**	**120 J**	**21 J**
Diethyl phthalate	100000000	100000000	ND (150)	ND (81)	ND (190)	ND (82)
Dimethyl phthalate	-	-	ND (150)	ND (81)	ND (190)	ND (82)
Di-n-butylphthalate	82000000	100000000	ND (150)	ND (81)	ND (190)	ND (82)
Di-n-octyl phthalate	8200000	18000000	ND (150)	ND (81)	ND (190)	ND (82)
Fluoranthene	30000000	68000000	**1900**	**460**	**890**	**220**
Fluorene	30000000	68000000	**56**	ND (17)	**53**	**20**
Hexachlorobenzene	9600	630000	ND (32)	ND (17)	ND (40)	ND (18)
Hexachlorobutadiene	17000	17000	ND (110)	ND (58)	ND (130)	ND (59)
Hexachlorocyclopentadiene	7500	16000	ND (700)	ND (380)	ND (890)	ND (390)
Hexachloroethane	80000	1100000	ND (110)	ND (58)	ND (130)	ND (59)
Indeno(1,2,3-cd)pyrene	210000	12000000	**690**	**680**	**210**	**100**
Isophorone	24000000	100000000	ND (110)	ND (58)	ND (130)	ND (59)
Naphthalene	170000	3100000	**85**	**55**	**59**	**23**
Nitrobenzene	220000	3100000	ND (210)	ND (120)	ND (270)	ND (120)
N-Nitrosodi-n-propylamine	3300	180000	ND (110)	ND (58)	ND (130)	ND (59)
N-Nitrosodiphenylamine	4700000	100000000	ND (110)	ND (58)	ND (130)	ND (59)
Pentachlorophenol	40000	2600000	ND (320)	ND (170)	ND (400)	ND (180)
Phenanthrene	-	-	**690**	**210**	**990**	**210**
Phenol	100000000	100000000	ND (110)	ND (58)	ND (130)	**45 J**
Pyrene	23000000	51000000	**1600**	**460**	**690**	**180**
Volatile Organic Compounds (ug/kg)						
1,1,1-Trichloroethane	640000	640000	ND (250) *	ND (290) *	ND (360) *	ND (290) *
1,1,2,2-Tetrachloroethane	27000	1900000	ND (250)	ND (290)	ND (360)	ND (290)
1,1,2-Trichloroethane	6300	35000	ND (250)	ND (290)	ND (360)	ND (290)
1,1-Dichloroethane	160000	1700000	ND (250)	ND (290)	ND (360)	ND (290)
1,1-Dichloroethene	1000000	1200000	ND (250)	ND (290)	ND (360)	ND (290)
1,2,4-Trichlorobenzene	260000	400000	ND (250)	ND (290)	ND (360)	ND (290)
1,2-Dibromo-3-chloropropane (DBCP)	640	86000	ND (500) *	ND (580) *	ND (720) *	ND (590) *
1,2-Dibromoethane (Ethylene Dibromide)	1600	180000	ND (250) *	ND (290) *	ND (360) *	ND (290) *
1,2-Dichlorobenzene	380000	380000	ND (250)	ND (290)	ND (360)	ND (290)
1,2-Dichloroethane	20000	730000	ND (250)	ND (290)	ND (360)	ND (290)
1,2-Dichloropropane	66000	360000	ND (250)	ND (290)	ND (360)	ND (290)
1,3-Dichlorobenzene	-	-	ND (250)	ND (290)	ND (360)	ND (290)
1,4-Dichlorobenzene	110000	16000000	ND (250)	ND (290)	ND (360)	ND (290)
2-Butanone (Methyl Ethyl Ketone)	28000000	28000000	ND (1000)	ND (1200)	ND (1400)	ND (1200)
2-Hexanone	1300000	3300000	ND (1000)	ND (1200)	ND (1400)	ND (1200)

APPENDIX - B
SUMMARY OF SOIL ANALYTICAL RESULTS
ARCELORMITTAL - INDIANA HARBOR LONG CARBON
EAST CHICAGO, INDIANA

Location Sample Date Sample Type Sample Depth (bgs)	IDEM Com/Ind Direct Contact	IDEM Excavation Direct Contact	SB-09 03/06/2019 N 0 - 2 (ft)	SB-09 03/06/2019 N 3 - 5 (ft)	SB-10 03/06/2019 N 0 - 2 (ft)	SB-10 03/06/2019 N 4 - 6 (ft)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	3400000	3400000	ND (1000)	ND (1200)	ND (1400)	ND (1200)
Acetone	100000000	100000000	ND (1000)	ND (1200)	ND (1400)	ND (1200)
Benzene	51000	1800000	ND (250)	ND (290)	ND (360)	ND (290)
Bromodichloromethane	13000	930000	ND (250)	ND (290)	ND (360)	ND (290)
Bromoform	860000	920000	ND (250) *	ND (290) *	ND (360) *	ND (290) *
Bromomethane (Methyl Bromide)	30000	160000	ND (250)	ND (290)	ND (360)	ND (290)
Carbon disulfide	740000	740000	ND (250)	ND (290)	ND (360)	ND (290)
Carbon tetrachloride	29000	460000	ND (250) *	ND (290) *	ND (360) *	ND (290) *
Chlorobenzene	760000	760000	ND (250)	ND (290)	ND (360)	ND (290)
Chloroethane	2100000	2100000	ND (250)	ND (290)	ND (360)	ND (290)
Chloroform (Trichloromethane)	14000	1900000	ND (250)	ND (290)	ND (360)	ND (290)
Chloromethane (Methyl Chloride)	460000	1300000	ND (250)	ND (290)	ND (360)	ND (290)
cis-1,2-Dichloroethene	2300000	2400000	ND (250)	ND (290)	ND (360)	ND (290)
cis-1,3-Dichloropropene	-	-	ND (250) *	ND (290) *	ND (360) *	ND (290) *
Cyclohexane	120000	120000	ND (500)	ND (580)	ND (720)	ND (590)
Dibromochloromethane	390000	800000	ND (250) *	ND (290) *	ND (360) *	ND (290) *
Dichlorodifluoromethane (CFC-12)	370000	850000	ND (250)	ND (290)	ND (360)	ND (290)
Ethylbenzene	250000	480000	ND (250)	ND (290)	ND (360)	ND (290)
Isopropylbenzene (Cumene)	270000	270000	ND (250)	ND (290)	ND (360)	ND (290)
Methyl acetate	29000000	29000000	**530 J**	ND (1500)	ND (1800)	ND (1500)
Methyl cyclohexane	-	-	ND (500)	ND (580)	ND (720)	ND (590)
Methyl Tert Butyl Ether	2100000	8900000	ND (250)	ND (290)	ND (360)	ND (290)
Methylene chloride	3200000	3300000	ND (500)	ND (580)	ND (720)	ND (590)
Naphthalene	170000	3.10E+06	ND (250)*	ND (290)*	ND (360)*	ND (290)*
Styrene	870000	870000	ND (250)	ND (290)	ND (360)	ND (290)
Tetrachloroethene	170000	170000	ND (250)	ND (290)	ND (360)	ND (290)
Toluene	820000	820000	ND (250)	ND (290)	ND (360)	ND (290)
trans-1,2-Dichloroethene	1900000	1900000	ND (250)	ND (290)	ND (360)	ND (290)
trans-1,3-Dichloropropene	-	-	ND (250) *	ND (290) *	ND (360) *	ND (290) *
Trichloroethene	19000	95000	ND (250)	ND (290)	ND (360)	ND (290)
Trichlorofluoromethane (CFC-11)	1200000	1200000	ND (250)	ND (290)	ND (360)	ND (290)
Trifluorotrichloroethane (Freon 113)	910000	910000	ND (250)	ND (290)	ND (360)	ND (290)
Vinyl chloride	17000	1300000	ND (250)	ND (290)	ND (360)	ND (290)
Xylene (total)	260000	260000	ND (500)	ND (580)	ND (720)	ND (590)

Notes:
1. Results in **bold** were detected.
2. Results in red exceed one or more of the following IDEM criteria (3/2019)
   [A] - Commercial/Industrial Direct Contact
   [B] - Excavation Direct Contact
3. ND - Not detected above reporting limit
   J - Estimated result
   F1 - MS and/or MSD Recovery outside of acceptance limits
   F2 - MS/MSD exceeds control limits
   F4 - MS/MSD RPD exceeds control limits due to sample size difference
   * - LCS or LCSD is outside of acceptance limits

APPENDIX C

ProUCL Calculations

Appendix C-1

Surface Soil 0 – 2 ft bgs

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/19/2019 9:34:12 AM
From File	2019-0618_HAI-Soil Risk Summaries_e.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Methyl cyclohexane

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	10
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Methyl cyclohexane was not processed!

Carbazole

General Statistics

Total Number of Observations	11	Number of Distinct Observations	9
Number of Detects	6	Number of Non-Detects	5
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	35	Minimum Non-Detect	54
Maximum Detect	120	Maximum Non-Detect	270
Variance Detects	938.7	Percent Non-Detects	45.45%
Mean Detects	86.33	SD Detects	30.64
Median Detects	92	CV Detects	0.355
Skewness Detects	-0.925	Kurtosis Detects	0.61
Mean of Logged Detects	4.387	SD of Logged Detects	0.449

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.24	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	79	KM Standard Error of Mean	13.05
KM SD	31.51	95% KM (BCA) UCL	101.1
95% KM (t) UCL	102.6	95% KM (Percentile Bootstrap) UCL	98.83
95% KM (z) UCL	100.5	95% KM Bootstrap t UCL	100.4
90% KM Chebyshev UCL	118.1	95% KM Chebyshev UCL	135.9
97.5% KM Chebyshev UCL	160.5	99% KM Chebyshev UCL	208.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.443	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level

K-S Test Statistic	0.283	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.167	k star (bias corrected MLE)	3.695
Theta hat (MLE)	12.05	Theta star (bias corrected MLE)	23.37
nu hat (MLE)	86.01	nu star (bias corrected)	44.34
Mean (detects)	86.33		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	35	Mean	79.36
Maximum	120	Median	77.52
SD	26.12	CV	0.329
k hat (MLE)	8.663	k star (bias corrected MLE)	6.361
Theta hat (MLE)	9.16	Theta star (bias corrected MLE)	12.48
nu hat (MLE)	190.6	nu star (bias corrected)	139.9
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (139.95, α)	113.6	Adjusted Chi Square Value (139.95, β)	109.7
95% Gamma Approximate UCL (use when n>=50)	97.75	95% Gamma Adjusted UCL (use when n<50)	101.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	79	SD (KM)	31.51
Variance (KM)	993.1	SE of Mean (KM)	13.05
k hat (KM)	6.284	k star (KM)	4.631
nu hat (KM)	138.3	nu star (KM)	101.9
theta hat (KM)	12.57	theta star (KM)	17.06
80% gamma percentile (KM)	107.1	90% gamma percentile (KM)	128.2
95% gamma percentile (KM)	147.4	99% gamma percentile (KM)	188.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (101.88, α)	79.59	Adjusted Chi Square Value (101.88, β)	76.38
95% Gamma Approximate KM-UCL (use when n>=50)	101.1	95% Gamma Adjusted KM-UCL (use when n<50)	105.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.844	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	77.84	Mean in Log Scale	4.292
SD in Original Scale	26.75	SD in Log Scale	0.389
95% t UCL (assumes normality of ROS data)	92.46	95% Percentile Bootstrap UCL	90.68
95% BCA Bootstrap UCL	90.82	95% Bootstrap t UCL	92.09
95% H-UCL (Log ROS)	101.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.268	KM Geo Mean	71.38
KM SD (logged)	0.478	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.198	95% H-UCL (KM -Log)	110.8
KM SD (logged)	0.478	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.198		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	90.45	Mean in Log Scale	4.398
SD in Original Scale	36.87	SD in Log Scale	0.534
95% t UCL (Assumes normality)	110.6	95% H-Stat UCL	136.4

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	102.6		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Dimethyl phthalate

General Statistics

Total Number of Observations	11	Number of Distinct Observations	9
Number of Detects	1	Number of Non-Detects	10
Number of Distinct Detects	1	Number of Distinct Non-Detects	8

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dimethyl phthalate was not processed!

Sulfide

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	41	Mean	412.7
Maximum	1500	Median	180
SD	550.9	Std. Error of Mean	166.1
Coefficient of Variation	1.335	Skewness	1.722

Normal GOF Test

Shapiro Wilk Test Statistic	0.661	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.306	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	713.8	95% Adjusted-CLT UCL (Chen-1995)	778.1
		95% Modified-t UCL (Johnson-1978)	728.1

Gamma GOF Test

A-D Test Statistic	0.749	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.209	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.264	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.83	k star (bias corrected MLE)	0.665
Theta hat (MLE)	497	Theta star (bias corrected MLE)	621.1
nu hat (MLE)	18.27	nu star (bias corrected)	14.62
MLE Mean (bias corrected)	412.7	MLE Sd (bias corrected)	506.3
		Approximate Chi Square Value (0.05)	6.998
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	6.158

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	862.3	95% Adjusted Gamma UCL (use when n<50)	979.9

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.918	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.19	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	3.714	Mean of logged Data	5.312
Maximum of Logged Data	7.313	SD of logged Data	1.218

Assuming Lognormal Distribution

95% H-UCL	1596	90% Chebyshev (MVUE) UCL	838.4
95% Chebyshev (MVUE) UCL	1044	97.5% Chebyshev (MVUE) UCL	1329
99% Chebyshev (MVUE) UCL	1890		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	685.9	95% Jackknife UCL	713.8
95% Standard Bootstrap UCL	670.1	95% Bootstrap-t UCL	1498
95% Hall's Bootstrap UCL	2279	95% Percentile Bootstrap UCL	684.2
95% BCA Bootstrap UCL	776.7		
90% Chebyshev(Mean, Sd) UCL	911	95% Chebyshev(Mean, Sd) UCL	1137
97.5% Chebyshev(Mean, Sd) UCL	1450	99% Chebyshev(Mean, Sd) UCL	2065

Suggested UCL to Use

95% Adjusted Gamma UCL	979.9		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Arsenic

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Number of Detects	5	Number of Non-Detects	6
Number of Distinct Detects	5	Number of Distinct Non-Detects	5
Minimum Detect	0.7	Minimum Non-Detect	4.5
Maximum Detect	5.6	Maximum Non-Detect	22
Variance Detects	3.513	Percent Non-Detects	54.55%
Mean Detects	3.74	SD Detects	1.874
Median Detects	3.8	CV Detects	0.501
Skewness Detects	-1.272	Kurtosis Detects	2.046
Mean of Logged Detects	1.12	SD of Logged Detects	0.843

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.895	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.291	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.452	KM Standard Error of Mean	0.823
KM SD	1.675	95% KM (BCA) UCL	4.644
95% KM (t) UCL	4.944	95% KM (Percentile Bootstrap) UCL	4.65
95% KM (z) UCL	4.806	95% KM Bootstrap t UCL	4.558
90% KM Chebyshev UCL	5.921	95% KM Chebyshev UCL	7.039
97.5% KM Chebyshev UCL	8.59	99% KM Chebyshev UCL	11.64

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.655	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.375	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.36	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.663	k star (bias corrected MLE)	1.199
Theta hat (MLE)	1.404	Theta star (bias corrected MLE)	3.12
nu hat (MLE)	26.63	nu star (bias corrected)	11.99
Mean (detects)	3.74		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.7	Mean	3.335

	A B C D E	F	G H I J K	L
271	Maximum	5.6	Median	3.161
272	SD	1.304	CV	0.391
273	k hat (MLE)	4.985	k star (bias corrected MLE)	3.686
274	Theta hat (MLE)	0.669	Theta star (bias corrected MLE)	0.905
275	nu hat (MLE)	109.7	nu star (bias corrected)	81.1
276	Adjusted Level of Significance (β)	0.0278		
277	Approximate Chi Square Value (81.10, α)	61.35	Adjusted Chi Square Value (81.10, β)	58.55
278	95% Gamma Approximate UCL (use when n>=50)	4.409	95% Gamma Adjusted UCL (use when n<50)	4.62
279				
280	**Estimates of Gamma Parameters using KM Estimates**			
281	Mean (KM)	3.452	SD (KM)	1.675
282	Variance (KM)	2.805	SE of Mean (KM)	0.823
283	k hat (KM)	4.249	k star (KM)	3.151
284	nu hat (KM)	93.47	nu star (KM)	69.31
285	theta hat (KM)	0.813	theta star (KM)	1.096
286	80% gamma percentile (KM)	4.896	90% gamma percentile (KM)	6.06
287	95% gamma percentile (KM)	7.145	99% gamma percentile (KM)	9.489
288				
289	**Gamma Kaplan-Meier (KM) Statistics**			
290	Approximate Chi Square Value (69.31, α)	51.15	Adjusted Chi Square Value (69.31, β)	48.61
291	95% Gamma Approximate KM-UCL (use when n>=50)	4.678	95% Gamma Adjusted KM-UCL (use when n<50)	4.923
292				
293	**Lognormal GOF Test on Detected Observations Only**			
294	Shapiro Wilk Test Statistic	0.739	**Shapiro Wilk GOF Test**	
295	5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level	
296	Lilliefors Test Statistic	0.388	**Lilliefors GOF Test**	
297	5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Level	
298	**Detected Data Not Lognormal at 5% Significance Level**			
299				
300	**Lognormal ROS Statistics Using Imputed Non-Detects**			
301	Mean in Original Scale	3.046	Mean in Log Scale	0.986
302	SD in Original Scale	1.44	SD in Log Scale	0.577
303	95% t UCL (assumes normality of ROS data)	3.833	95% Percentile Bootstrap UCL	3.733
304	95% BCA Bootstrap UCL	3.756	95% Bootstrap t UCL	3.924
305	95% H-UCL (Log ROS)	4.803		
306				
307	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**			
308	KM Mean (logged)	1.018	KM Geo Mean	2.767
309	KM SD (logged)	0.782	95% Critical H Value (KM-Log)	2.601
310	KM Standard Error of Mean (logged)	0.403	95% H-UCL (KM -Log)	7.146
311	KM SD (logged)	0.782	95% Critical H Value (KM-Log)	2.601
312	KM Standard Error of Mean (logged)	0.403		
313				
314	**DL/2 Statistics**			
315	**DL/2 Normal**		**DL/2 Log-Transformed**	
316	Mean in Original Scale	5.341	Mean in Log Scale	1.449
317	SD in Original Scale	3.199	SD in Log Scale	0.797
318	95% t UCL (Assumes normality)	7.089	95% H-Stat UCL	11.34
319	**DL/2 is not a recommended method, provided for comparisons and historical reasons**			
320				
321	**Nonparametric Distribution Free UCL Statistics**			
322	**Detected Data appear Normal Distributed at 5% Significance Level**			
323				
324	**Suggested UCL to Use**			

325	95% KM (t) UCL	4.944		
326				
327	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
328	Recommendations are based upon data size, data distribution, and skewness.			
329	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
330	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
408				
409	Iron			
410				
411	**General Statistics**			
412	Total Number of Observations	11	Number of Distinct Observations	11
413			Number of Missing Observations	0
414	Minimum	6100	Mean	62736
415	Maximum	210000	Median	44000
416	SD	58715	Std. Error of Mean	17703
417	Coefficient of Variation	0.936	Skewness	1.72
418				
419	**Normal GOF Test**			
420	Shapiro Wilk Test Statistic	0.839	**Shapiro Wilk GOF Test**	
421	5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
422	Lilliefors Test Statistic	0.198	**Lilliefors GOF Test**	
423	5% Lilliefors Critical Value	0.251	Data appear Normal at 5% Significance Level	
424	**Data appear Approximate Normal at 5% Significance Level**			
425				
426	**Assuming Normal Distribution**			
427	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
428	95% Student's-t UCL	94823	95% Adjusted-CLT UCL (Chen-1995)	101663
429			95% Modified-t UCL (Johnson-1978)	96353
430				
431	**Gamma GOF Test**			
432	A-D Test Statistic	0.143	**Anderson-Darling Gamma GOF Test**	
433	5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level	
434	K-S Test Statistic	0.0932	**Kolmogorov-Smirnov Gamma GOF Test**	
435	5% K-S Critical Value	0.261	Detected data appear Gamma Distributed at 5% Significance Level	
436	**Detected data appear Gamma Distributed at 5% Significance Level**			
437				
438	**Gamma Statistics**			
439	k hat (MLE)	1.323	k star (bias corrected MLE)	1.023
440	Theta hat (MLE)	47406	Theta star (bias corrected MLE)	61321
441	nu hat (MLE)	29.11	nu star (bias corrected)	22.51
442	MLE Mean (bias corrected)	62736	MLE Sd (bias corrected)	62025
443			Approximate Chi Square Value (0.05)	12.72
444	Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	11.54
445				
446	**Assuming Gamma Distribution**			
447	95% Approximate Gamma UCL (use when n>=50))	111014	95% Adjusted Gamma UCL (use when n<50)	122403
448				
449	**Lognormal GOF Test**			
450	Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk Lognormal GOF Test**	
451	5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
452	Lilliefors Test Statistic	0.154	**Lilliefors Lognormal GOF Test**	
453	5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	
454	**Data appear Lognormal at 5% Significance Level**			
455				

Lognormal Statistics			
Minimum of Logged Data	8.716	Mean of logged Data	10.62
Maximum of Logged Data	12.25	SD of logged Data	1.042
Assuming Lognormal Distribution			
95% H-UCL	195131	90% Chebyshev (MVUE) UCL	132250
95% Chebyshev (MVUE) UCL	162224	97.5% Chebyshev (MVUE) UCL	203826
99% Chebyshev (MVUE) UCL	285545		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	91856	95% Jackknife UCL	94823
95% Standard Bootstrap UCL	90139	95% Bootstrap-t UCL	112357
95% Hall's Bootstrap UCL	232493	95% Percentile Bootstrap UCL	91191
95% BCA Bootstrap UCL	100818		
90% Chebyshev(Mean, Sd) UCL	115846	95% Chebyshev(Mean, Sd) UCL	139903
97.5% Chebyshev(Mean, Sd) UCL	173294	99% Chebyshev(Mean, Sd) UCL	238882
Suggested UCL to Use			
95% Student's-t UCL	94823		
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Manganese			
General Statistics			
Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	540	Mean	6276
Maximum	16000	Median	4200
SD	5247	Std. Error of Mean	1582
Coefficient of Variation	0.836	Skewness	1.136
Normal GOF Test			
Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.316	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	9143	95% Adjusted-CLT UCL (Chen-1995)	9457
		95% Modified-t UCL (Johnson-1978)	9234

Gamma GOF Test			
A-D Test Statistic	0.516	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.218	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.26	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.56	k star (bias corrected MLE)	1.195
Theta hat (MLE)	4022	Theta star (bias corrected MLE)	5250
nu hat (MLE)	34.33	nu star (bias corrected)	26.3
MLE Mean (bias corrected)	6276	MLE Sd (bias corrected)	5740
		Approximate Chi Square Value (0.05)	15.61
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	14.28
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	10574	95% Adjusted Gamma UCL (use when n<50)	11557
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.91	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.292	Mean of logged Data	8.391
Maximum of Logged Data	9.68	SD of logged Data	0.962
Assuming Lognormal Distribution			
95% H-UCL	17060	90% Chebyshev (MVUE) UCL	12717
95% Chebyshev (MVUE) UCL	15478	97.5% Chebyshev (MVUE) UCL	19309
99% Chebyshev (MVUE) UCL	26835		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	8878	95% Jackknife UCL	9143
95% Standard Bootstrap UCL	8751	95% Bootstrap-t UCL	10584
95% Hall's Bootstrap UCL	9297	95% Percentile Bootstrap UCL	8791
95% BCA Bootstrap UCL	9276		
90% Chebyshev(Mean, Sd) UCL	11022	95% Chebyshev(Mean, Sd) UCL	13172
97.5% Chebyshev(Mean, Sd) UCL	16155	99% Chebyshev(Mean, Sd) UCL	22016
Suggested UCL to Use			
95% Adjusted Gamma UCL	11557		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Thallium			

	A	B	C	D	E	F	G	H	I	J	K	L
564												
565	General Statistics											
566	Total Number of Observations					11	Number of Distinct Observations					10
567	Number of Detects					1	Number of Non-Detects					10
568	Number of Distinct Detects					1	Number of Distinct Non-Detects					9
569												
570	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
571	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
572												
573	The data set for variable Thallium was not processed!											
574												
575												

Appendix C-2

Total Soil 0 – 10 feet bgs

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.16/19/2019 9:35:12 AM
From File	2019-0618_HAI-Soil Risk Summaries_d.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Methyl cyclohexane

General Statistics

Total Number of Observations	22	Number of Distinct Observations	15
Number of Detects	2	Number of Non-Detects	20
Number of Distinct Detects	2	Number of Distinct Non-Detects	13
Minimum Detect	80	Minimum Non-Detect	500
Maximum Detect	120	Maximum Non-Detect	720
Variance Detects	800	Percent Non-Detects	90.91%
Mean Detects	100	SD Detects	28.28
Median Detects	100	CV Detects	0.283
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	4.585	SD of Logged Detects	0.287

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	100	KM Standard Error of Mean	20
KM SD	20	95% KM (BCA) UCL	N/A
95% KM (t) UCL	134.4	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	132.9	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	160	95% KM Chebyshev UCL	187.2
97.5% KM Chebyshev UCL	224.9	99% KM Chebyshev UCL	299

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	24.66	k star (bias corrected MLE)	N/A
Theta hat (MLE)	4.055	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	98.65	nu star (bias corrected)	N/A
Mean (detects)	100		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	100	SD (KM)	20
Variance (KM)	400	SE of Mean (KM)	20
k hat (KM)	25	k star (KM)	21.62
nu hat (KM)	1100	nu star (KM)	951.3
theta hat (KM)	4	theta star (KM)	4.625
80% gamma percentile (KM)	117.5	90% gamma percentile (KM)	128.4

	A	B	C	D	E	F	G	H	I	J	K	L
55					95% gamma percentile (KM)	137.8					99% gamma percentile (KM)	156.7
56												
57	Gamma Kaplan-Meier (KM) Statistics											
58											Adjusted Level of Significance (β)	0.0386
59					Approximate Chi Square Value (951.33, α)	880.7					Adjusted Chi Square Value (951.33, β)	875.7
60					95% Gamma Approximate KM-UCL (use when n>=50)	108					95% Gamma Adjusted KM-UCL (use when n<50)	108.6
61												
62	Lognormal GOF Test on Detected Observations Only											
63	Not Enough Data to Perform GOF Test											
64												
65	Lognormal ROS Statistics Using Imputed Non-Detects											
66					Mean in Original Scale	99.53					Mean in Log Scale	4.585
67					SD in Original Scale	18.06					SD in Log Scale	0.182
68					95% t UCL (assumes normality of ROS data)	106.2					95% Percentile Bootstrap UCL	105.6
69					95% BCA Bootstrap UCL	105.2					95% Bootstrap t UCL	106.6
70					95% H-UCL (Log ROS)	106.8						
71												
72	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
73					KM Mean (logged)	4.585					KM Geo Mean	97.98
74					KM SD (logged)	0.203					95% Critical H Value (KM-Log)	1.777
75					KM Standard Error of Mean (logged)	0.203					95% H-UCL (KM -Log)	108.2
76					KM SD (logged)	0.203					95% Critical H Value (KM-Log)	1.777
77					KM Standard Error of Mean (logged)	0.203						
78												
79	DL/2 Statistics											
80	DL/2 Normal						DL/2 Log-Transformed					
81					Mean in Original Scale	272.7					Mean in Log Scale	5.567
82					SD in Original Scale	62.79					SD in Log Scale	0.337
83					95% t UCL (Assumes normality)	295.8					95% H-Stat UCL	317.7
84	DL/2 is not a recommended method, provided for comparisons and historical reasons											
85												
86	Nonparametric Distribution Free UCL Statistics											
87	Data do not follow a Discernible Distribution at 5% Significance Level											
88												
89	Suggested UCL to Use											
90					95% KM (t) UCL	134.4					KM H-UCL	108.2
91					95% KM (BCA) UCL	N/A						
92	Warning: One or more Recommended UCL(s) not available!											
93	Warning: Recommended UCL exceeds the maximum observation											
94												
95	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
96	Recommendations are based upon data size, data distribution, and skewness.											
97	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
98	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
99												
100	Carbazole											
101												
102	General Statistics											
103					Total Number of Observations	22					Number of Distinct Observations	18
104					Number of Detects	10					Number of Non-Detects	12
105					Number of Distinct Detects	9					Number of Distinct Non-Detects	9
106					Minimum Detect	25					Minimum Non-Detect	53
107					Maximum Detect	120					Maximum Non-Detect	270
108					Variance Detects	1306					Percent Non-Detects	54.55%

	A B C D E	F	G H I J K	L
109	Mean Detects	70.4	SD Detects	36.14
110	Median Detects	80.5	CV Detects	0.513
111	Skewness Detects	-0.0927	Kurtosis Detects	-1.824
112	Mean of Logged Detects	4.105	SD of Logged Detects	0.608
113				
114	**Normal GOF Test on Detects Only**			
115	Shapiro Wilk Test Statistic	0.887	**Shapiro Wilk GOF Test**	
116	5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
117	Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**	
118	5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	
119	**Detected Data appear Normal at 5% Significance Level**			
120				
121	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**			
122	KM Mean	53.11	KM Standard Error of Mean	8.183
123	KM SD	32.27	95% KM (BCA) UCL	67.29
124	95% KM (t) UCL	67.19	95% KM (Percentile Bootstrap) UCL	67.12
125	95% KM (z) UCL	66.57	95% KM Bootstrap t UCL	68.99
126	90% KM Chebyshev UCL	77.66	95% KM Chebyshev UCL	88.78
127	97.5% KM Chebyshev UCL	104.2	99% KM Chebyshev UCL	134.5
128				
129	**Gamma GOF Tests on Detected Observations Only**			
130	A-D Test Statistic	0.639	**Anderson-Darling GOF Test**	
131	5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level	
132	K-S Test Statistic	0.258	**Kolmogorov-Smirnov GOF**	
133	5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Level	
134	**Detected data appear Gamma Distributed at 5% Significance Level**			
135				
136	**Gamma Statistics on Detected Data Only**			
137	k hat (MLE)	3.516	k star (bias corrected MLE)	2.528
138	Theta hat (MLE)	20.02	Theta star (bias corrected MLE)	27.85
139	nu hat (MLE)	70.33	nu star (bias corrected)	50.56
140	Mean (detects)	70.4		
141				
142	**Gamma ROS Statistics using Imputed Non-Detects**			
143	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
144	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
145	For such situations, GROS method may yield incorrect values of UCLs and BTVs			
146	This is especially true when the sample size is small.			
147	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
148	Minimum	25	Mean	53.83
149	Maximum	120	Median	41.68
150	SD	29.41	CV	0.546
151	k hat (MLE)	4.131	k star (bias corrected MLE)	3.598
152	Theta hat (MLE)	13.03	Theta star (bias corrected MLE)	14.96
153	nu hat (MLE)	181.8	nu star (bias corrected)	158.3
154	Adjusted Level of Significance (β)	0.0386		
155	Approximate Chi Square Value (158.33, α)	130.2	Adjusted Chi Square Value (158.33, β)	128.3
156	95% Gamma Approximate UCL (use when n>=50)	65.43	95% Gamma Adjusted UCL (use when n<50)	66.4
157				
158	**Estimates of Gamma Parameters using KM Estimates**			
159	Mean (KM)	53.11	SD (KM)	32.27
160	Variance (KM)	1041	SE of Mean (KM)	8.183
161	k hat (KM)	2.709	k star (KM)	2.37
162	nu hat (KM)	119.2	nu star (KM)	104.3

theta hat (KM)	19.6	theta star (KM)	22.41
80% gamma percentile (KM)	77.92	90% gamma percentile (KM)	99.31
95% gamma percentile (KM)	119.5	99% gamma percentile (KM)	163.9
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (104.29, α)	81.73	Adjusted Chi Square Value (104.29, β)	80.24
95% Gamma Approximate KM-UCL (use when n>=50)	67.78	95% Gamma Adjusted KM-UCL (use when n<50)	69.03
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.862	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	52.93	Mean in Log Scale	3.842
SD in Original Scale	29.52	SD in Log Scale	0.496
95% t UCL (assumes normality of ROS data)	63.76	95% Percentile Bootstrap UCL	63.5
95% BCA Bootstrap UCL	65.02	95% Bootstrap t UCL	66.95
95% H-UCL (Log ROS)	65.41		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	3.807	KM Geo Mean	45
KM SD (logged)	0.558	95% Critical H Value (KM-Log)	2.052
KM Standard Error of Mean (logged)	0.148	95% H-UCL (KM -Log)	67.47
KM SD (logged)	0.558	95% Critical H Value (KM-Log)	2.052
KM Standard Error of Mean (logged)	0.148		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	62.66	Mean in Log Scale	3.931
SD in Original Scale	40.65	SD in Log Scale	0.658
95% t UCL (Assumes normality)	77.57	95% H-Stat UCL	86.21
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	67.19		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Dimethyl phthalate			
General Statistics			
Total Number of Observations	22	Number of Distinct Observations	14
Number of Detects	1	Number of Non-Detects	21
Number of Distinct Detects	1	Number of Distinct Non-Detects	13

217	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!			
218	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).			
219				
220	The data set for variable Dimethyl phthalate was not processed!			
221				
222				
223	Sulfide			
224				
225	**General Statistics**			
226	Total Number of Observations	22	Number of Distinct Observations	18
227	Number of Detects	17	Number of Non-Detects	5
228	Number of Distinct Detects	15	Number of Distinct Non-Detects	3
229	Minimum Detect	19	Minimum Non-Detect	32
230	Maximum Detect	1500	Maximum Non-Detect	36
231	Variance Detects	224026	Percent Non-Detects	22.73%
232	Mean Detects	280.3	SD Detects	473.3
233	Median Detects	83	CV Detects	1.689
234	Skewness Detects	2.337	Kurtosis Detects	4.433
235	Mean of Logged Detects	4.659	SD of Logged Detects	1.368
236				
237	**Normal GOF Test on Detects Only**			
238	Shapiro Wilk Test Statistic	0.57	**Shapiro Wilk GOF Test**	
239	5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level	
240	Lilliefors Test Statistic	0.307	**Lilliefors GOF Test**	
241	5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Level	
242	**Detected Data Not Normal at 5% Significance Level**			
243				
244	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**			
245	KM Mean	221.6	KM Standard Error of Mean	91.85
246	KM SD	417.9	95% KM (BCA) UCL	370
247	95% KM (t) UCL	379.6	95% KM (Percentile Bootstrap) UCL	374.9
248	95% KM (z) UCL	372.7	95% KM Bootstrap t UCL	814.1
249	90% KM Chebyshev UCL	497.1	95% KM Chebyshev UCL	621.9
250	97.5% KM Chebyshev UCL	795.2	99% KM Chebyshev UCL	1135
251				
252	**Gamma GOF Tests on Detected Observations Only**			
253	A-D Test Statistic	1.158	**Anderson-Darling GOF Test**	
254	5% A-D Critical Value	0.787	Detected Data Not Gamma Distributed at 5% Significance Level	
255	K-S Test Statistic	0.26	**Kolmogorov-Smirnov GOF**	
256	5% K-S Critical Value	0.219	Detected Data Not Gamma Distributed at 5% Significance Level	
257	**Detected Data Not Gamma Distributed at 5% Significance Level**			
258				
259	**Gamma Statistics on Detected Data Only**			
260	k hat (MLE)	0.628	k star (bias corrected MLE)	0.556
261	Theta hat (MLE)	446.3	Theta star (bias corrected MLE)	503.7
262	nu hat (MLE)	21.35	nu star (bias corrected)	18.92
263	Mean (detects)	280.3		
264				
265	**Gamma ROS Statistics using Imputed Non-Detects**			
266	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
267	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
268	For such situations, GROS method may yield incorrect values of UCLs and BTVs			
269	This is especially true when the sample size is small.			
270	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			

Minimum	0.01	Mean	216.6
Maximum	1500	Median	56
SD	430.3	CV	1.987
k hat (MLE)	0.251	k star (bias corrected MLE)	0.247
Theta hat (MLE)	862.1	Theta star (bias corrected MLE)	875.9
nu hat (MLE)	11.05	nu star (bias corrected)	10.88
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (10.88, α)	4.499	Adjusted Chi Square Value (10.88, β)	4.196
95% Gamma Approximate UCL (use when n>=50)	523.8	95% Gamma Adjusted UCL (use when n<50)	561.6
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	221.6	SD (KM)	417.9
Variance (KM)	174655	SE of Mean (KM)	91.85
k hat (KM)	0.281	k star (KM)	0.273
nu hat (KM)	12.37	nu star (KM)	12.02
theta hat (KM)	788.2	theta star (KM)	811.4
80% gamma percentile (KM)	331.2	90% gamma percentile (KM)	660.2
95% gamma percentile (KM)	1044	99% gamma percentile (KM)	2054
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (12.02, α)	5.237	Adjusted Chi Square Value (12.02, β)	4.906
95% Gamma Approximate KM-UCL (use when n>=50)	508.4	95% Gamma Adjusted KM-UCL (use when n<50)	542.7
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	220.8	Mean in Log Scale	4.247
SD in Original Scale	428.2	SD in Log Scale	1.435
95% t UCL (assumes normality of ROS data)	377.8	95% Percentile Bootstrap UCL	385.9
95% BCA Bootstrap UCL	425.4	95% Bootstrap t UCL	721.8
95% H-UCL (Log ROS)	539.4		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	4.297	KM Geo Mean	73.45
KM SD (logged)	1.348	95% Critical H Value (KM-Log)	3.098
KM Standard Error of Mean (logged)	0.298	95% H-UCL (KM -Log)	452.9
KM SD (logged)	1.348	95% Critical H Value (KM-Log)	3.098
KM Standard Error of Mean (logged)	0.298		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	220.5	Mean in Log Scale	4.249
SD in Original Scale	428.3	SD in Log Scale	1.423
95% t UCL (Assumes normality)	377.7	95% H-Stat UCL	523
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Level			

325	Suggested UCL to Use			
326	95% KM (Chebyshev) UCL	621.9		
327				
328	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
329	Recommendations are based upon data size, data distribution, and skewness.			
330	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
331	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
332				
333	Arsenic			
334				
335	General Statistics			
336	Total Number of Observations	22	Number of Distinct Observations	20
337	Number of Detects	16	Number of Non-Detects	6
338	Number of Distinct Detects	15	Number of Distinct Non-Detects	5
339	Minimum Detect	0.7	Minimum Non-Detect	4.5
340	Maximum Detect	5.9	Maximum Non-Detect	22
341	Variance Detects	2.249	Percent Non-Detects	27.27%
342	Mean Detects	3.25	SD Detects	1.5
343	Median Detects	3.45	CV Detects	0.461
344	Skewness Detects	0.132	Kurtosis Detects	-0.663
345	Mean of Logged Detects	1.051	SD of Logged Detects	0.567
346				
347	Normal GOF Test on Detects Only			
348	Shapiro Wilk Test Statistic	0.967	Shapiro Wilk GOF Test	
349	5% Shapiro Wilk Critical Value	0.887	Detected Data appear Normal at 5% Significance Level	
350	Lilliefors Test Statistic	0.133	Lilliefors GOF Test	
351	5% Lilliefors Critical Value	0.213	Detected Data appear Normal at 5% Significance Level	
352	Detected Data appear Normal at 5% Significance Level			
353				
354	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
355	KM Mean	3.193	KM Standard Error of Mean	0.359
356	KM SD	1.424	95% KM (BCA) UCL	3.759
357	95% KM (t) UCL	3.811	95% KM (Percentile Bootstrap) UCL	3.764
358	95% KM (z) UCL	3.784	95% KM Bootstrap t UCL	3.818
359	90% KM Chebyshev UCL	4.271	95% KM Chebyshev UCL	4.759
360	97.5% KM Chebyshev UCL	5.437	99% KM Chebyshev UCL	6.768
361				
362	Gamma GOF Tests on Detected Observations Only			
363	A-D Test Statistic	0.35	Anderson-Darling GOF Test	
364	5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
365	K-S Test Statistic	0.179	Kolmogorov-Smirnov GOF	
366	5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level	
367	Detected data appear Gamma Distributed at 5% Significance Level			
368				
369	Gamma Statistics on Detected Data Only			
370	k hat (MLE)	4.083	k star (bias corrected MLE)	3.359
371	Theta hat (MLE)	0.796	Theta star (bias corrected MLE)	0.968
372	nu hat (MLE)	130.7	nu star (bias corrected)	107.5
373	Mean (detects)	3.25		
374				
375	Gamma ROS Statistics using Imputed Non-Detects			
376	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
377	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
378	For such situations, GROS method may yield incorrect values of UCLs and BTVs			

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.7	Mean	3.15
Maximum	5.9	Median	3.085
SD	1.296	CV	0.411
k hat (MLE)	5.34	k star (bias corrected MLE)	4.642
Theta hat (MLE)	0.59	Theta star (bias corrected MLE)	0.679
nu hat (MLE)	234.9	nu star (bias corrected)	204.2
Adjusted Level of Significance (β)	0.0386		
Approximate Chi Square Value (204.24, α)	172.2	Adjusted Chi Square Value (204.24, β)	170
95% Gamma Approximate UCL (use when n>=50)	3.737	95% Gamma Adjusted UCL (use when n<50)	3.786

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.193	SD (KM)	1.424
Variance (KM)	2.029	SE of Mean (KM)	0.359
k hat (KM)	5.025	k star (KM)	4.37
nu hat (KM)	221.1	nu star (KM)	192.3
theta hat (KM)	0.635	theta star (KM)	0.731
80% gamma percentile (KM)	4.358	90% gamma percentile (KM)	5.24
95% gamma percentile (KM)	6.048	99% gamma percentile (KM)	7.767

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (192.28, α)	161.2	Adjusted Chi Square Value (192.28, β)	159.1
95% Gamma Approximate KM-UCL (use when n>=50)	3.809	95% Gamma Adjusted KM-UCL (use when n<50)	3.86

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.101	Mean in Log Scale	1.033
SD in Original Scale	1.313	SD in Log Scale	0.487
95% t UCL (assumes normality of ROS data)	3.583	95% Percentile Bootstrap UCL	3.538
95% BCA Bootstrap UCL	3.574	95% Bootstrap t UCL	3.621
95% H-UCL (Log ROS)	3.906		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.035	KM Geo Mean	2.814
KM SD (logged)	0.546	95% Critical H Value (KM-Log)	2.04
KM Standard Error of Mean (logged)	0.14	95% H-UCL (KM -Log)	4.165
KM SD (logged)	0.546	95% Critical H Value (KM-Log)	2.04
KM Standard Error of Mean (logged)	0.14		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	4.184	Mean in Log Scale	1.234
SD in Original Scale	2.67	SD in Log Scale	0.666
95% t UCL (Assumes normality)	5.164	95% H-Stat UCL	5.873

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Row				
433	Detected Data appear Normal Distributed at 5% Significance Level			
434				
435	**Suggested UCL to Use**			
436	95% KM (t) UCL	3.811		
437				
438	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
439	Recommendations are based upon data size, data distribution, and skewness.			
440	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
441	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
521				
522				
523	Iron			
524				
525	**General Statistics**			
526	Total Number of Observations	22	Number of Distinct Observations	22
527			Number of Missing Observations	0
528	Minimum	3500	Mean	37114
529	Maximum	210000	Median	15000
530	SD	49221	Std. Error of Mean	10494
531	Coefficient of Variation	1.326	Skewness	2.374
532				
533	**Normal GOF Test**			
534	Shapiro Wilk Test Statistic	0.704	**Shapiro Wilk GOF Test**	
535	5% Shapiro Wilk Critical Value	0.911	Data Not Normal at 5% Significance Level	
536	Lilliefors Test Statistic	0.247	**Lilliefors GOF Test**	
537	5% Lilliefors Critical Value	0.184	Data Not Normal at 5% Significance Level	
538	**Data Not Normal at 5% Significance Level**			
539				
540	**Assuming Normal Distribution**			
541	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**	
542	95% Student's-t UCL	55171	95% Adjusted-CLT UCL (Chen-1995)	60050
543			95% Modified-t UCL (Johnson-1978)	56056
544				
545	**Gamma GOF Test**			
546	A-D Test Statistic	0.879	**Anderson-Darling Gamma GOF Test**	
547	5% A-D Critical Value	0.78	Data Not Gamma Distributed at 5% Significance Level	
548	K-S Test Statistic	0.196	**Kolmogorov-Smirnov Gamma GOF Test**	
549	5% K-S Critical Value	0.192	Data Not Gamma Distributed at 5% Significance Level	
550	**Data Not Gamma Distributed at 5% Significance Level**			
551				
552	**Gamma Statistics**			
553	k hat (MLE)	0.809	k star (bias corrected MLE)	0.729
554	Theta hat (MLE)	45894	Theta star (bias corrected MLE)	50930
555	nu hat (MLE)	35.58	nu star (bias corrected)	32.06
556	MLE Mean (bias corrected)	37114	MLE Sd (bias corrected)	43477
557			Approximate Chi Square Value (0.05)	20.12
558	Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	19.42
559				
560	**Assuming Gamma Distribution**			
561	95% Approximate Gamma UCL (use when n>=50))	59138	95% Adjusted Gamma UCL (use when n<50)	61288
562				
563	**Lognormal GOF Test**			
564	Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**	
565	5% Shapiro Wilk Critical Value	0.911	Data appear Lognormal at 5% Significance Level	

Lilliefors Test Statistic	0.175	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.184	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	8.161	Mean of logged Data	9.789
Maximum of Logged Data	12.25	SD of logged Data	1.25
Assuming Lognormal Distribution			
95% H-UCL	87050	90% Chebyshev (MVUE) UCL	71222
95% Chebyshev (MVUE) UCL	86832	97.5% Chebyshev (MVUE) UCL	108499
99% Chebyshev (MVUE) UCL	151058		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	54375	95% Jackknife UCL	55171
95% Standard Bootstrap UCL	53644	95% Bootstrap-t UCL	69220
95% Hall's Bootstrap UCL	120183	95% Percentile Bootstrap UCL	55214
95% BCA Bootstrap UCL	59673		
90% Chebyshev(Mean, Sd) UCL	68595	95% Chebyshev(Mean, Sd) UCL	82856
97.5% Chebyshev(Mean, Sd) UCL	102648	99% Chebyshev(Mean, Sd) UCL	141527
Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	82856		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Manganese

General Statistics			
Total Number of Observations	22	Number of Distinct Observations	20
		Number of Missing Observations	0
Minimum	120	Mean	3542
Maximum	16000	Median	1250
SD	4735	Std. Error of Mean	1009
Coefficient of Variation	1.337	Skewness	1.723
Normal GOF Test			
Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.911	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.184	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	5279	95% Adjusted-CLT UCL (Chen-1995)	5599
		95% Modified-t UCL (Johnson-1978)	5341

Gamma GOF Test

A-D Test Statistic	0.896	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.798	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.214	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.195	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.57	k star (bias corrected MLE)	0.523
Theta hat (MLE)	6211	Theta star (bias corrected MLE)	6775
nu hat (MLE)	25.09	nu star (bias corrected)	23.01
MLE Mean (bias corrected)	3542	MLE Sd (bias corrected)	4899
		Approximate Chi Square Value (0.05)	13.1
Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	12.54

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6223	95% Adjusted Gamma UCL (use when n<50)	6500

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.911	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.182	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.184	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.787	Mean of logged Data	7.081
Maximum of Logged Data	9.68	SD of logged Data	1.683

Assuming Lognormal Distribution

95% H-UCL	18697	90% Chebyshev (MVUE) UCL	9988
95% Chebyshev (MVUE) UCL	12571	97.5% Chebyshev (MVUE) UCL	16155
99% Chebyshev (MVUE) UCL	23196		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5203	95% Jackknife UCL	5279
95% Standard Bootstrap UCL	5180	95% Bootstrap-t UCL	6114
95% Hall's Bootstrap UCL	5893	95% Percentile Bootstrap UCL	5244
95% BCA Bootstrap UCL	5550		
90% Chebyshev(Mean, Sd) UCL	6571	95% Chebyshev(Mean, Sd) UCL	7942
97.5% Chebyshev(Mean, Sd) UCL	9846	99% Chebyshev(Mean, Sd) UCL	13586

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	7942		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Thallium

General Statistics

Total Number of Observations	22	Number of Distinct Observations	17
Number of Detects	2	Number of Non-Detects	20
Number of Distinct Detects	2	Number of Distinct Non-Detects	15
Minimum Detect	4.8	Minimum Non-Detect	0.84
Maximum Detect	6.7	Maximum Non-Detect	22
Variance Detects	1.805	Percent Non-Detects	90.91%
Mean Detects	5.75	SD Detects	1.344
Median Detects	5.75	CV Detects	0.234
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.735	SD of Logged Detects	0.236

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.415	KM Standard Error of Mean	0.546
KM SD	1.601	95% KM (BCA) UCL	N/A
95% KM (t) UCL	2.355	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.314	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	3.054	95% KM Chebyshev UCL	3.797
97.5% KM Chebyshev UCL	4.827	99% KM Chebyshev UCL	6.852

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	36.3	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.158	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	145.2	nu star (bias corrected)	N/A
Mean (detects)	5.75		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.415	SD (KM)	1.601
Variance (KM)	2.565	SE of Mean (KM)	0.546
k hat (KM)	0.781	k star (KM)	0.704
nu hat (KM)	34.35	nu star (KM)	31
theta hat (KM)	1.813	theta star (KM)	2.009
80% gamma percentile (KM)	2.325	90% gamma percentile (KM)	3.546
95% gamma percentile (KM)	4.805	99% gamma percentile (KM)	7.808

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0386
Approximate Chi Square Value (31.00, α)	19.28	Adjusted Chi Square Value (31.00, β)	18.59
95% Gamma Approximate KM-UCL (use when n>=50)	2.275	95% Gamma Adjusted KM-UCL (use when n<50)	2.359

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.351	Mean in Log Scale	0.778
SD in Original Scale	1.193	SD in Log Scale	0.362
95% t UCL (assumes normality of ROS data)	2.789	95% Percentile Bootstrap UCL	2.804
95% BCA Bootstrap UCL	2.978	95% Bootstrap t UCL	3.519
95% H-UCL (Log ROS)	2.696		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.0507	KM Geo Mean	1.052
KM SD (logged)	0.617	95% Critical H Value (KM-Log)	2.112
KM Standard Error of Mean (logged)	0.212	95% H-UCL (KM -Log)	1.69
KM SD (logged)	0.617	95% Critical H Value (KM-Log)	2.112
KM Standard Error of Mean (logged)	0.212		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.87	Mean in Log Scale	0.362
SD in Original Scale	3.35	SD in Log Scale	1.212
95% t UCL (Assumes normality)	4.099	95% H-Stat UCL	6.426

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.355	KM H-UCL	1.69
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX D

Intake and Risk Calculations

Appendix D-1

Industrial Worker
(Surface soil 0 – 2 ft bgs)

Site-specific
Composite Worker Equation Inputs for Soil

*** Inputted values different from Composite Worker defaults are highlighted.**

Variable	Composite Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.8653
A (VF Dispersion Constant)	11.911	16.8653
A (VF Dispersion Constant - Mass Limit)	11.911	16.8653
B (PEF Dispersion Constant)	18.7762	18.7848
B (VF Dispersion Constant)	18.4385	18.7848
B (VF Dispersion Constant - Mass Limit)	18.4385	18.7848
$City_{PEF}$ (Climate Zone) Selection	Default	Chicago, IL (7)
$City_{VF}$ (Climate Zone) Selection	Default	Chicago, IL (7)
C (PEF Dispersion Constant)	216.108	215.0624
C (VF Dispersion Constant)	209.7845	215.0624
C (VF Dispersion Constant - Mass Limit)	209.7845	215.0624
d_s (depth of source) m	.	3.05
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.182
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_b (dry soil bulk density) g/cm ^{3}	1.5	1.5
p_b (dry soil bulk density - mass limit) g/cm ^{3}	1.5	1.5
PEF (particulate emission factor) m ^{3}/kg	1359344438	533937644.86794
p_s (soil particle density) g/cm ^{3}	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	60.621128543083
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	60.621128543083
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	60.621128543083
A_s (PEF acres)	0.5	9
A_s (VF acres)	0.5	9
A_s (VF mass-limit acres)	0.5	9
AF_w (skin adherence factor - composite worker) mg/cm ^{2}	0.12	0.12
AT_w (averaging time - composite worker)	365	365
BW_w (body weight - composite worker)	80	80
ED_w (exposure duration - composite worker) yr	25	25

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Site-specific
Composite Worker Equation Inputs for Soil

*** Inputted values different from Composite Worker defaults are highlighted.**

Variable	Composite Worker Soil Default Value	Form-input Value
EF_w (exposure frequency - composite worker) day/yr	250	250
ET_w (exposure time - composite worker) hr	8	8
THQ (target hazard quotient) unitless	0.1	0.1
IR_w (soil ingestion rate - composite worker) mg/day	100	100
LT (lifetime) yr	70	70
SA_w (surface area - composite worker) cm^2/day	3527	3527
TR (target risk) unitless	1.0E-06	1.0E-06
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	4.65
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.1
VF_{ml} (volitization factor - mass limit) m^3/kg	.	10864.578284831

Site-specific
Composite Worker Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o $(mg/kg-day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	I	4.30E-03	I	3.00E-04	I	1.50E-05	C	1	0.03	0.6
Carbazole	86-74-8	No	No	Organics	-		-		-		-		1	0.1	1
Dimethylphthalate	131-11-3	No	No	Organics	-		-		-		-		1	0.1	1
Iron	7439-89-6	No	No	Inorganics	-		-		7.00E-01	P	-		1	-	1
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	S	5.00E-05	I	0.04	-	1
Methylcyclohexane	108-87-2	No	Yes	Organics	-		-		-		-		1	-	1
Sulfide	18496-25-8	No	No	Inorganics	-		-		-		-		1	-	1
Thallium (Soluble Salts)	7440-28-0	No	No	Inorganics	-		-		1.00E-05	X	-		1	-	1

Site-specific
Composite Worker Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)	K_d\ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)
Arsenic, Inorganic	-	-	-	2.90E+01	-	-		888.15	PHYSPROP	1673
Carbazole	-	1.80E+00	9.16E+03	-	1.16E-07	4.74E-06	PHYSPROP	627.85	PHYSPROP	899
Dimethylphthalate	-	4.00E+03	3.16E+01	-	1.97E-07	8.05E-06	EPI	556.85	PHYSPROP	772
Iron	-	-	-	2.50E+01	-	-		3273.15	PERRY	9340
Manganese (Non-diet)	-	-	-	6.50E+01	-	-		2368.15	PHYSPROP	4325
Methylcyclohexane	6.76E+01	1.40E+01	2.34E+02	1.40E+00	4.30E-01	1.76E+01	PHYSPROP	374.05	PHYSPROP	572.3
Sulfide	-	-	-	-	-	-		-		-
Thallium (Soluble Salts)	-	-	-	7.10E+01	-	-		1730.15	PHYSPROP	4648.06

Site-specific
Composite Worker Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	TC Ref	Chemical Type	D_{ia}\ (cm^2/s)	D_{iw}\ (cm^2/s)	D_A\ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)
Arsenic, Inorganic	CRC89	INORGANIC	-	-	-	5.34E+08	-	3.63E+00	1.72E+01	1.52E+03	2.99E+00
Carbazole	YAWS	SVOC	4.17E-02	7.45E-06	-	5.34E+08	-	-	-	-	-
Dimethylphthalate	CRC89	SVOC	2.99E-02	7.14E-06	-	5.34E+08	-	-	-	-	-
Iron	CRC89	INORGANIC	-	-	-	5.34E+08	-	-	-	-	-
Manganese (Non-diet)	CRC89	INORGANIC	-	-	-	5.34E+08	-	-	-	-	-
Methylcyclohexane	CRC89	VOC	7.00E-02	8.27E-06	1.36E-02	5.34E+08	1.09E+04	-	-	-	-
Sulfide		INORGANIC	-	-	-	5.34E+08	-	-	-	-	-
Thallium (Soluble Salts)	YAWS	INORGANIC	-	-	-	5.34E+08	-	-	-	-	-

Site-specific
Composite Worker Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	Ingestion SL THQ=0.1 (mg/kg)	Dermal SL THQ=0.1 (mg/kg)	Inhalation SL THQ=0.1 (mg/kg)	Noncarcinogenic SL THI=0.1 (mg/kg)	Screening Level (mg/kg)
Arsenic, Inorganic	5.84E+01	2.76E+02	3.51E+03	4.75E+01	2.99E+00 ca*
Carbazole	-	-	-	-	
Dimethylphthalate	-	-	-	-	
Iron	8.18E+04	-	-	8.18E+04	8.18E+04 nc
Manganese (Non-diet)	2.80E+03	-	1.17E+04	2.26E+03	2.26E+03 nc
Methylcyclohexane	-	-	-	-	
Sulfide	-	-	-	-	
Thallium (Soluble Salts)	1.17E+00	-	-	1.17E+00	1.17E+00 nc

Site-specific
Composite Worker Risk for Soil

Chemical	SF_o (mg/kg-day)$^{-1}$	SF_o Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)	K_d\ (cm^3/g)
Arsenic, Inorganic	1.50E+00	I	4.30E-03	I	3.00E-04	I	1.50E-05	C	1	0.03	0.6	-	-	-	2.90E+01
Carbazole	-		-		-		-		1	0.1	1	-	1.80E+00	9.16E+03	-
Dimethylphthalate	-		-		-		-		1	0.1	1	-	4.00E+03	3.16E+01	-
Iron	-		-		7.00E-01	P	-		1	-	1	-	-	-	2.50E+01
Manganese (Non-diet)	-		-		2.40E-02	S	5.00E-05	I	0.04	-	1	-	-	-	6.50E+01
Methylcyclohexane	-		-		-		-		1	-	1	6.76E+01	1.40E+01	2.34E+02	1.40E+00
Sulfide	-		-		-		-		1	-	1	-	-	-	-
Thallium (Soluble Salts)	-		-		1.00E-05	X	-		1	-	1	-	-	-	7.10E+01
**Total Risk/HI*	-		-		-		-		-	-	-	-	-	-	-

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Site-specific
Composite Worker Risk for Soil

Chemical	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia}\ (cm^2/s)	D_{iw}\ (cm^2/s)	D_A\ (cm^2/s)	Particulate Emission Factor (m^3/kg)
Arsenic, Inorganic	-	-		888.15	PHYSPROP	1673	CRC89	INORGANIC	-	-	-	5.34E+08
Carbazole	1.16E-07	4.74E-06	PHYSPROP	627.85	PHYSPROP	899	YAWS	SVOC	4.17E-02	7.45E-06	-	5.34E+08
Dimethylphthalate	1.97E-07	8.05E-06	EPI	556.85	PHYSPROP	772	CRC89	SVOC	2.99E-02	7.14E-06	-	5.34E+08
Iron	-	-		3273.15	PERRY	9340	CRC89	INORGANIC	-	-	-	5.34E+08
Manganese (Non-diet)	-	-		2368.15	PHYSPROP	4325	CRC89	INORGANIC	-	-	-	5.34E+08
Methylcyclohexane	4.30E-01	1.76E+01	PHYSPROP	374.05	PHYSPROP	572.3	CRC89	VOC	7.00E-02	8.27E-06	1.36E-02	5.34E+08
Sulfide	-	-		-		-		INORGANIC	-	-	-	5.34E+08
Thallium (Soluble Salts)	-	-		1730.15	PHYSPROP	4648.06	YAWS	INORGANIC	-	-	-	5.34E+08
**Total Risk/HI*	-	-		-		-			-	-	-	-

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Site-specific
Composite Worker Risk for Soil

Chemical	Volatilization Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion HQ	Dermal HQ	Inhalation HQ	Noncarcinogenic HI
Arsenic, Inorganic	-	4.94E+00	1.36E-06	2.88E-07	3.24E-09	1.65E-06	8.46E-03	1.79E-03	1.41E-04	1.04E-02
Carbazole	-	1.03E-01	-	-	-	-	-	-	-	-
Dimethylphthalate	-	7.00E-02	-	-	-	-	-	-	-	-
Iron	-	9.48E+04	-	-	-	-	1.16E-01	-	-	1.16E-01
Manganese (Non-diet)	-	1.16E+04	-	-	-	-	4.12E-01	-	9.88E-02	5.11E-01
Methylcyclohexane	1.09E+04	8.00E-02	-	-	-	-	-	-	-	-
Sulfide	-	9.80E+02	-	-	-	-	-	-	-	-
Thallium (Soluble Salts)	-	6.70E+00	-	-	-	-	5.74E-01	-	-	5.74E-01
**Total Risk/HI*	*-*	*-*	*1.36E-06*	*2.88E-07*	*3.24E-09*	*1.65E-06*	*1.11E+00*	*1.79E-03*	*9.90E-02*	*1.21E+00*

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Appendix D-2

Re-development Construction Worker
(Total soil 0 – 10 ft bgs)

Site-specific
Construction Worker Equation Inputs for Soil - Other Construction Activities

*** Inputted values different from Construction Worker defaults are highlighted.**

Variable	Construction Worker Soil - Other Default Value	Form-input Value
$A_{c\text{-}doz}$ (areal extent of dozing) acres	.	2
A_{excav} (area of excavation site) m^2	.	8048
$A_{c\text{-}grade}$ (areal extent of grading) acres	.	2
A (PEF Dispersion Constant)	2.4538	2.4538
A_{till} (areal extent of tilling) acres	.	0
$B_{l\text{-}doz}$ (dozing blade length) m	.	2
$B_{l\text{-}grade}$ (grading blade length) m	.	2
B (PEF Dispersion Constant)	17.5660	17.5660
C (PEF Dispersion Constant)	189.0426	189.0426
d_{excav} (average depth of excavation site) m	.	3.048
F_D Unitless Dispersion Correction Factor	0.185837208	0.185837208
F(x) (function dependant on U_m/U_t derived using Cowherd et al. (1985))	0.194	0.194
$M_{m\text{-}doz}$ (Gravimetric soil moisture content) %	7.9	7.9
$M_{m\text{-}excav}$ (Gravimetric soil moisture content) %	12	12
M_{wind} (dust emitted by wind erosion) g	51288.84717	35215.654183401
$N_{A\text{-}doz}$ (number of times site was dozed)	.	1
$N_{A\text{-}dump}$ (number of times soil is dumped)	2	2
$N_{A\text{-}grade}$ (number of times site was graded)	.	2
$N_{A\text{-}till}$ (number of times soil is tilled)	2	0
Q/C_{sa} (inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source) g/m^2-s per kg/m^3	14.31407	11.063057776908
p_{soil} (density) g/cm^3 - chemical-specific	1.68	1.68
A_c (acres)	0.5	2
s_{doz} (soil silt content) %	6.9	6.9
AF_{cw} (skin adherence factor - construction worker) mg/cm^2	0.3	0.3
AT_{cw} (averaging time - construction worker) days	365	365
BW_{cw} (body weight - construction worker) kg	80	80
ED_{cw} (exposure duration - construction worker) yr	1	1
EF_{cw} (exposure frequency - construction worker) day/yr	250	250

Site-specific
Construction Worker Equation Inputs for Soil - Other Construction Activities

*** Inputted values different from Construction Worker defaults are highlighted.**

Variable	Construction Worker Soil - Other Default Value	Form-input Value
ET_{cw} (exposure time - construction worker) hr/day	8	8
THQ (target hazard quotient) unitless	0.1	0.1
IRS_{cw} (soil ingestion rate - construction worker) mg/day	330	330
LT (lifetime) yr	70	70
SA_{cw} (surface area - construction worker) cm^2/day	3527	3527
TR (target cancer risk) unitless	1.0E-06	1.0E-06
S_{doz} (dozing speed) kph	11.4	11.4
S_{grade} (grading speed) kph	11.4	11.4
s_{till} (soil silt content) %	18	18
t_c (overall duration of construction) hours	8400	8400
T_c (overall duration of construction) s	30240000	30240000
T (time over which traffic occurs) s	7200000	7200000
T_t (overall duration of traffic) s	7200000	7200000
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value) m/s	11.32	11.32
V (fraction of vegetative cover)	0	0

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Site-specific
Construction Worker Regional Screening Levels (RSL) for Soil - Other Construction Activities

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	I	4.30E-03	I	3.00E-04	I /Chronic	1.50E-05
Carbazole	86-74-8	No	No	Organics	-		-		-		-
Dimethylphthalate	131-11-3	No	No	Organics	-		-		1.00E-01	X /Subchronic	-
Iron	7439-89-6	No	No	Inorganics	-		-		7.00E-01	P /Subchronic	-
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	S /Chronic	5.00E-05
Methylcyclohexane	108-87-2	No	Yes	Organics	-		-		-		-
Sulfide	18496-25-8	No	No	Inorganics	-		-		-		-
Thallium (Soluble Salts)	7440-28-0	No	No	Inorganics	-		-		4.00E-05	X /Subchronic	-

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Site-specific
Construction Worker Regional Screening Levels (RSL) for Soil - Other Construction Activities

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)	K_d\ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref
Arsenic, Inorganic	C /Chronic	1	0.03	0.6	-	-	-	2.90E+01	-	-	
Carbazole		1	0.1	1	-	1.80E+00	9.16E+03	-	1.16E-07	4.74E-06	PHYSPROP
Dimethylphthalate		1	0.1	1	-	4.00E+03	3.16E+01	-	1.97E-07	8.05E-06	EPI
Iron		1	-	1	-	-	-	2.50E+01	-	-	
Manganese (Non-diet)	I /Chronic	0.04	-	1	-	-	-	6.50E+01	-	-	
Methylcyclohexane		1	-	1	6.76E+01	1.40E+01	2.34E+02	1.40E+00	4.30E-01	1.76E+01	PHYSPROP
Sulfide		1	-	1	-	-	-	-	-	-	
Thallium (Soluble Salts)		1	-	1	-	-	-	7.10E+01	-	-	

Site-specific
Construction Worker Regional Screening Levels (RSL) for Soil - Other Construction Activities

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia}\ (cm^2/s)	D_{iw}\ (cm^2/s)	D_A\ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)
Arsenic, Inorganic	888.15	PHYSPROP	1673	CRC89	INORGANIC	-	-	-	7.09E+07	-
Carbazole	627.85	PHYSPROP	899	YAWS	SVOC	4.17E-02	7.45E-06	-	7.09E+07	-
Dimethylphthalate	556.85	PHYSPROP	772	CRC89	SVOC	2.99E-02	7.14E-06	-	7.09E+07	-
Iron	3273.15	PERRY	9340	CRC89	INORGANIC	-	-	-	7.09E+07	-
Manganese (Non-diet)	2368.15	PHYSPROP	4325	CRC89	INORGANIC	-	-	-	7.09E+07	-
Methylcyclohexane	374.05	PHYSPROP	572.3	CRC89	VOC	7.00E-02	8.27E-06	1.36E-02	7.09E+07	3.94E+02
Sulfide	-		-		INORGANIC	-	-	-	7.09E+07	-
Thallium (Soluble Salts)	1730.15	PHYSPROP	4648.06	YAWS	INORGANIC	-	-	-	7.09E+07	-

Site-specific
Construction Worker Regional Screening Levels (RSL) for Soil - Other Construction Activities

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=0.1 (mg/kg)	Dermal SL THQ=0.1 (mg/kg)	Inhalation SL THQ=0.1 (mg/kg)	Noncarcinogenic SL THI=0.1 (mg/kg)	Screening Level (mg/kg)
Arsenic, Inorganic	2.75E+01	1.72E+02	5.06E+03	2.36E+01	1.70E+01	1.06E+02	4.47E+02	1.42E+01	1.42E+01 nc
Carbazole	-	-	-	-	-	-	-	-	
Dimethylphthalate	-	-	-	-	3.39E+03	1.06E+04	-	2.57E+03	2.57E+03 nc
Iron	-	-	-	-	2.38E+04	-	-	2.38E+04	2.38E+04 nc
Manganese (Non-diet)	-	-	-	-	8.15E+02	-	1.49E+03	5.27E+02	5.27E+02 nc
Methylcyclohexane	-	-	-	-	-	-	-	-	
Sulfide	-	-	-	-	-	-	-	-	
Thallium (Soluble Salts)	-	-	-	-	1.36E+00	-	-	1.36E+00	1.36E+00 nc

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Site-specific
Construction Worker Risk for Soil - Other Construction Activities

Chemical	SF_o (mg/kg-day) $^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc}\ (cm^3/g)
Arsenic, Inorganic	1.50E+00	I	4.30E-03	I	3.00E-04	I /Chronic	1.50E-05	C /Chronic	1	0.03	0.6	-	-	-
Carbazole	-		-		-		-		1	0.1	1	-	1.80E+00	9.16E+03
Dimethylphthalate	-		-		1.00E-01	X /Subchronic	-		1	0.1	1	-	4.00E+03	3.16E+01
Iron	-		-		7.00E-01	P /Subchronic	-		1	-	1	-	-	-
Manganese (Non-diet)	-		-		2.40E-02	S /Chronic	5.00E-05	I /Chronic	0.04	-	1	-	-	-
Methylcyclohexane	-		-		-		-		1	-	1	6.76E+01	1.40E+01	2.34E+02
Sulfide	-		-		-		-		1	-	1	-	-	-
Thallium (Soluble Salts)	-		-		4.00E-05	X /Subchronic	-		1	-	1	-	-	-
**Total Risk/HI*	-		-		-		-		-	-	-	-	-	-

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Site-specific
Construction Worker Risk for Soil - Other Construction Activities

Chemical	K_d\ (cm^3/g)	HLC ($atm\text{-}m^3/mole$)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia}\ (cm^2/s)	D_{iw}\ (cm^2/s)	D_A\ (cm^2/s)
Arsenic, Inorganic	2.90E+01	-	-		888.15	PHYSPROP	1673	CRC89	INORGANIC	-	-	-
Carbazole	-	1.16E-07	4.74E-06	PHYSPROP	627.85	PHYSPROP	899	YAWS	SVOC	4.17E-02	7.45E-06	-
Dimethylphthalate	-	1.97E-07	8.05E-06	EPI	556.85	PHYSPROP	772	CRC89	SVOC	2.99E-02	7.14E-06	-
Iron	2.50E+01	-	-		3273.15	PERRY	9340	CRC89	INORGANIC	-	-	-
Manganese (Non-diet)	6.50E+01	-	-		2368.15	PHYSPROP	4325	CRC89	INORGANIC	-	-	-
Methylcyclohexane	1.40E+00	4.30E-01	1.76E+01	PHYSPROP	374.05	PHYSPROP	572.3	CRC89	VOC	7.00E-02	8.27E-06	1.36E-02
Sulfide	-	-	-		-		-		INORGANIC	-	-	-
Thallium (Soluble Salts)	7.10E+01	-	-		1730.15	PHYSPROP	4648.06	YAWS	INORGANIC	-	-	-
**Total Risk/HI*	-	-	-		-		-			-	-	-

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Site-specific
Construction Worker Risk for Soil - Other Construction Activities

Chemical	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion HQ	Dermal HQ	Inhalation HQ	Noncarcinogenic HI
Arsenic, Inorganic	7.09E+07	-	3.81E+00	1.38E-07	2.22E-08	7.54E-10	1.61E-07	2.25E-02	3.60E-03	8.53E-04	2.69E-02
Carbazole	7.09E+07	-	6.70E-02	-	-	-	-	-	-	-	-
Dimethylphthalate	7.09E+07	-	7.00E-02	-	-	-	-	2.06E-06	6.61E-07	-	2.72E-06
Iron	7.09E+07	-	8.29E+04	-	-	-	-	3.49E-01	-	-	3.49E-01
Manganese (Non-diet)	7.09E+07	-	7.94E+03	-	-	-	-	9.75E-01	-	5.33E-01	1.51E+00
Methylcyclohexane	7.09E+07	3.94E+02	1.20E-01	-	-	-	-	-	-	-	-
Sulfide	7.09E+07	-	6.22E+02	-	-	-	-	-	-	-	-
Thallium (Soluble Salts)	7.09E+07	-	2.36E+00	-	-	-	-	1.74E-01	-	-	1.74E-01
*Total Risk/HI	-	-	-	1.38E-07	2.22E-08	7.54E-10	1.61E-07	1.52E+00	3.60E-03	5.34E-01	2.06E+00

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Appendix D-3

Construction Worker – Groundwater

Site-specific
Recreator Equation Inputs for Surface Water

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Surface Water Default Value	Form-input Value
BW_{0-2} (body weight) kg	15	0
BW_{2-6} (body weight) kg	15	0
BW_{6-16} (body weight) kg	80	0
BW_{16-30} (body weight) kg	80	80
BW_{a} (body weight - adult) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
$DFW_{rec-adj}$ (age-adjusted dermal factor) cm ^{2}-event/kg	.	5510.938
$DFWM_{rec-adj}$ (mutagenic age-adjusted dermal factor) cm ^{2}-event/kg	.	5510.938
ED_{rec} (exposure duration - recreator) years	26	1
ED_{0-2} (exposure duration) years	2	0
ED_{2-6} (exposure duration) years	4	0
ED_{6-16} (exposure duration) years	10	0
ED_{16-30} (exposure duration) years	10	1
ED_{rec-a} (exposure duration - adult) years	20	1
EF_{rec-w} (exposure frequency) days/year	.	125
EF_{0-2} (exposure frequency) days/year	.	0
EF_{2-6} (exposure frequency) days/year	.	0
EF_{6-16} (exposure frequency) days/year	.	0
EF_{16-30} (exposure frequency) days/year	.	125
EF_{rec-a} (adult exposure frequency) days/year	.	125
ET_{0-2} (exposure time) hours/event	.	0
ET_{2-6} (exposure time) hours/event	.	0
ET_{6-16} (exposure time) hours/event	.	0
ET_{16-30} (exposure time) hours/event	.	8
ET_{rec-a} (adult exposure time) hours/event	.	8
EV_{0-2} (events) events/day	.	0
EV_{2-6} (events) events/day	.	0
EV_{6-16} (events) events/day	.	0
EV_{16-30} (events) events/day	.	1

Output generated 22JUL2019:13:23:58

Site-specific
Recreator Equation Inputs for Surface Water

*** Inputted values different from Recreator defaults are highlighted.**

Variable	Recreator Surface Water Default Value	Form-input Value
EV_{rec-a} (adult) events/day	.	1
THQ (target hazard quotient) unitless	0.1	1
$IFW_{rec-adj}$ (age-adjusted water intake rate) L/kg	.	0.125
$IFWM_{rec-adj}$ (mutagenic age-adjusted water intake rate) L/kg	.	0.125
IRW_{0-2} (water intake rate) L/hour	0.12	0
IRW_{2-6} (water intake rate) L/hour	0.12	0
IRW_{6-16} (water intake rate) L/hour	0.071	0
IRW_{16-30} (water intake rate) L/hour	0.071	.01
IRW_{rec} (water intake rate - adult) L/day	0.071	0.01
IRW_{rec-a} (water intake rate - adult) L/hr	0.071	0.01
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm^2	6365	0
SA_{2-6} (skin surface area) cm^2	6365	0
SA_{6-16} (skin surface area) cm^2	19652	0
SA_{16-30} (skin surface area) cm^2	19652	3527
SA_{rec} (skin surface area - adult) cm^2	19652	3527
SA_{rec-a} (skin surface area - adult) cm^2	19652	3527
Apparent thickness of stratum corneum (cm)	0.001	0.001
TR (target risk) unitless	1.0E-06	1.0E-05

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Site-specific
Recreator Regional Screening Levels (RSL) for Surface Water

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	Chemical Type	SF_o (mg/kg-day)$^{-1}$	SF_o Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	Inorganics	1.50E+00	I	3.00E-04	I /Chronic	1.50E-05
Benzene	71-43-2	No	Yes	Organics	Organics	5.50E-02	I	1.00E-02	P /Subchronic	8.00E-02
Iron	7439-89-6	No	No	Inorganics	Inorganics	-		7.00E-01	P /Subchronic	-
Tetrachloroethylene	127-18-4	No	Yes	Organics	Organics	2.10E-03	I	1.00E-01	H /Subchronic	4.00E-02
Trichloroethylene	79-01-6	Yes	Yes	Organics	Organics	4.60E-02	I	5.00E-04	I /Chronic	2.00E-03

Chemical	RfC Ref	RAGSe GIABS (unitless)	K_p\ (cm/hr)	MW	FA (unitless)	In EPD?	$DA_{event (ca)}$	DA_{event} (nc child)	DA_{event} (nc adult)	Ingestion SL TR=1E-05 (ug/L)	Dermal SL TR=1E-05 (ug/L)
Arsenic, Inorganic	C /Chronic	1	0.001	74.922	1	Yes	0.0309082	-	0.0198696	1.36E+03	3.86E+03
Benzene	P /Subchronic	1	0.0149	78.115	1	Yes	0.8429517	-	0.6623193	3.72E+04	6.88E+03
Iron		1	0.001	55.847	1	Yes	-	-	46.362348	-	-
Tetrachloroethylene	I /Chronic	1	0.0334	165.83	1	Yes	22.077306	-	6.6231925	9.73E+05	7.40E+04
Trichloroethylene	I /Chronic	1	0.0116	131.39	1	Yes	1.0018658	-	0.033116	4.42E+04	9.80E+03

Chemical	Carcinogenic SL TR=1E-05 (ug/L)	Ingestion SL (Child) THQ=1 (ug/L)	Dermal SL (Child) THQ=1 (ug/L)	Noncarcinogenic SL (Child) THQ=1 (ug/L)	Ingestion SL (Adult) THQ=1 (ug/L)	Dermal SL (Adult) THQ=1 (ug/L)	Noncarcinogenic SL (Adult) THQ=1 (ug/L)	Screening Level (ug/L)
Arsenic, Inorganic	1.01E+03	-	-	-	8.76E+02	2.48E+03	6.48E+02	6.48E+02 nc
Benzene	5.81E+03	-	-	-	2.92E+04	5.41E+03	4.56E+03	4.56E+03 nc
Iron	-	-	-	-	2.04E+06	5.80E+06	1.51E+06	1.51E+06 nc
Tetrachloroethylene	6.87E+04	-	-	-	2.92E+05	2.22E+04	2.06E+04	2.06E+04 nc
Trichloroethylene	8.02E+03	-	-	-	1.46E+03	3.24E+02	2.65E+02	2.65E+02 nc

Output generated 22JUL2019:13:23:58